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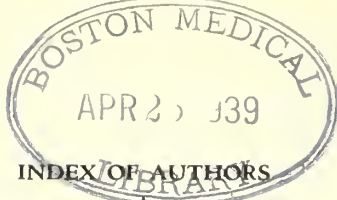
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Great Northern Railway Surgeons' Association

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ON NOVEMBER 4, 1938
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Clinical Significance of Glycosuria*

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RECENTLY in the literature attention has been drawn to the marked increase of diabetes mellitus, both as to total number of cases and its increasing importance as a cause of death. The purpose of this communication is to outline briefly some of the important facts regarding glycosuria in the hope that they may aid in the early diagnosis and treatment of a disturbance in carbohydrate metabolism.

Glycosuria may be defined as the excretion of glucose in the urine.

Incidence

The incidence of glycosuria during routine physical examination on a group of young adults may range from five-tenths to two per cent.

Significance of Glycosuria

Sixteen to twenty per cent of the cases with glycosuria on one occasion will have a disturbance in carbohydrate metabolism if not frank diabetes.

Causes of False Reducing Reactions

Benedict's and Haines' qualitative tests are probably the most widely used for detection of glycosuria.

Excesses of certain normal constituents of the urine such as mucin, uric acid and creatin may give positive reducing reactions, particularly if the urine is concentrated. By diluting the urine, volume for volume with

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water, and using the usual six to eight drops, reduction will still occur if glycosuria exists.

Drugs, such as chloral, chloroform, acetanilid, morphine, sulfanol salicylates, balsams excreted with glycuronic acid and formaldehyde after taking urotropin will cause reduction. By stopping ingestion of all drugs and repeating the test the reduction if due to any of the foregoing drugs will disappear.

Certain rare metabolic disturbances such as homogentisic acid (alkaptonuria) and dehydroxyphenylalanine (tyrosinosis) may cause reduction.

Other reducing sugars may be found in the urine, such as levulose, lactose, galactose, maltose and pentose. Glucose, however, is the only one that will ferment. These reducing sugars may be differentiated by use of the simple fermentation tube. A simpler test and one which will at the same time give a quantitative approximation of the amount of glucose, if present, may be carried out as follows:

Obtain 100 cc. of urine, determine the specific gravity, and add one-fourth cake of yeast. Allow the solution to remain near warm radiator overnight and again determine the specific gravity. If the second specific gravity determination is less than the first, fermentation has occurred and dextrose is present. Further, if the difference in the specific gravity readings is multiplied by the factor .26 one gets the approximate number of grams of dextrose per 100 cc. of urine.

Conditions Causing Glycosuria

A. Glycosuria in the presence of normal blood sugar values may occur in any one of the following conditions:

1. *Lowered renal threshold for glucose.* To explain this phenomenon one must recall that when the blood passes through the kidney glomeruli, part of the glucose is filtered through glomerular membranes and reabsorbed in the tubules. The reabsorption mechanism is not perfect normally so that on an average about 140 mg. of glucose are found in the 24 hour specimens of normal men. This amount is so small that ordinary clinical methods will not detect it. If the glucose of the blood rises above 140* to 180 (depending on author), the reabsorbing mechanism of the tubules fails to keep pace with the filtration and some glucose appears in the urine. The point where this phenomenon takes place is called *renal threshold*. To obtain the true renal threshold for glucose, the only accurate method is to insert catheters into the ureters before ingestion of glucose; then, testing the blood and urine every few minutes until glycosuria occurs. This, however, is not a practical clinical procedure. Why the ability of the tubules to reabsorb glucose varies so widely in otherwise normal people has not been explained. Certain facts have come from our own personal experience with a large number of glucose tolerance tests done on cases of glycosuria (531 cases, 1931-36).

- a. This condition is in no way associated with diabetes mellitus.
- b. The renal threshold may be as low as 110 and occasionally lower.
- c. The renal threshold may vary in the same individual from time to time.
- d. Certain toxic substances and drugs may temporarily alter the renal threshold.

Because of the normal variations in renal threshold, a distinction is made between a lowered renal threshold, which is not uncommon (11% in the author's normal series), and true renal glycosuria.

2. *Renal glycosuria* is extremely uncommon, but the term is frequently misused for the condition of lowered renal threshold discussed in the preceding paragraph. In the Diabetic Clinic of the Montreal General Hospital, 4,000 cases of glycosuria were investigated and only seven cases conformed to the criteria listed below to enable a diagnosis of renal glycosuria.

- a. Glycosuria must be constant.
- b. Type of sugar in urine must be glucose.
- c. Little or no relation between intake or excretion of sugar.
- d. No clinical signs or symptoms of diabetes.

* All blood sugar values are expressed as mgm. per 100 cc. of blood.

e. Ideally, no family history of diabetes.

f. Fasting blood sugar and glucose tolerance test must be within normal limits.

g. Utilization of sugar as determined by the respiratory metabolism must be normal.

h. The individual must not subsequently develop diabetes.

3. *In pregnancy*, particularly during the first three and seventh to ninth months, a reducing substance may be found in the urine which by the fermentation test will be glucose. The reason for this cannot be satisfactorily explained, but a glucose tolerance test is indicated to rule out the presence of diabetes mellitus.

B. Glycosuria in the presence of an elevated blood sugar may be caused by:

1. Diabetes mellitus (most common).
2. Endocrine dysfunctions: pituitary, thyroid, adrenal.
3. Alimentary hyperglycemia. It is suggested that this term replace the term alimentary glycosuria. The glycosuria occurring after a large intake of sweets or carbohydrates is so often disregarded as being alimentary in cause and effect. One must remember that, in reality, the blood sugar must rise above the normal renal threshold (180) for glycosuria to appear, and when it does it implies a slowing in production if not an actual deficiency of insulin. This, in turn, may be the first manifestation of early diabetes mellitus.
4. "Cerebral hyperglycemia," due to increased intracranial pressure, inflammatory diseases of the central nervous system or brain tumor.
5. Acute infections. (The glycosuria produced here may last weeks or months.)
6. Hemochromatosis or bronze diabetes.
7. Coronary heart disease.
8. Gallbladder or liver disease.
9. Tumors of the pancreas that may destroy islets of Langerhans.
10. Acute pancreatitis.
11. Intravenous glucose administration.
12. Drugs, such as adrenalin, morphine, carbon monoxide and anesthetics, may cause a rise in blood sugar with resultant glycosuria.

Classification of Glycosuria in Relation to Time of Its Occurrence

When the presence of glycosuria has been definitely established an attempt should be made to find out how frequently during a twenty-four hour period it occurs. Thus the following classification may be used:

1. *Transient glycosuria*, e. g., the occurrence of glucose in the urine at indefinite intervals such as every other day, once a week, etc. This type, if undiagnosed and untreated, may progress into the second type.

2. *Postprandial glycosuria*, *e. g.*, occurring after one or all meals, but usually disappearing between meals. This may progress into the third stage.
 3. *Persistent glycosuria*, *e. g.*, occurring in the urine at all times. This type may be further classified as follows:
 - a. Persistent glycosuria without clinical signs and symptoms.
 - b. Persistent glycosuria with clinical signs and symptoms.
 - c. Persistent glycosuria with clinical signs and symptoms and acidosis.
- "a" needs further study before treatment, but "b" and "c" are definite evidence of diabetes mellitus.

Importance of History

Once the diagnosis and type of glycosuria are established, the history may be an important aid in differentiating "innocent glycosuria" from diabetes mellitus. Certain important points are:

1. Family history of diabetes or "renal glycosuria." (The latter as well as the former is sometimes seen in members of the same family.)
2. Presence or absence of the three P's of diabetes—polyuria, polydipsia and polyphagia.
3. Recent gain or loss in weight. (Either of these conditions may occur. The former is more usual in older individuals with mild diabetes. The latter is more common in young adults with more severe diabetes.)
4. History of unexplained fatigue, neuritis, mild visual disturbances, recent boils, carbuncles, or acute infections.
5. Drug ingestion that may give reducing substances in the urine.
6. When was specimen collected? How long after eating and what food was eaten at the meal preceding the test?
7. Cleanliness of urinary receptacle? (Cough syrups, lotions, *etc.*, may give reduction.)

Importance of the Physical Examination

A complete physical examination should reveal whether the patient is suffering from most of the causes of glycosuria discussed in the paragraph, "Glycosuria in the Presence of an Elevated Blood Sugar."

Important Precautions for Collecting Urine Specimens

Too often a patient having glycosuria on one occasion and not on another is reassured that no disturbance of importance is present. This is not always true.

It should be remembered that the blood sugar normally is usually higher in the early morning than any time during the day. It may, let us say, be 160, which is above the normal fasting but below the normal renal threshold for glucose. Thus, a fasting urine would have

no glycosuria, though a definite disturbance of carbohydrate metabolism existed. If, however, breakfast was eaten and the urine collected approximately two hours afterward, glycosuria would be found. Thus the fallacy of testing a fasting specimen and the importance of analyzing a post-prandial specimen in attempting to demonstrate glycosuria are shown.

If glycosuria is present it should be considered evidence *per se* of diabetes mellitus until proved otherwise. Only with this attitude on the part of the physician can early diagnosis and treatment of a disturbance of carbohydrate metabolism be made.

The Glucose Tolerance Test

The glucose tolerance test is a laboratory test that must be carried out under certain standard conditions; otherwise its results may be grossly misleading.

The patient should be on a normal diet. For instance, a diet extremely low in carbohydrate and exceedingly high in fat, preceding a tolerance test, will cause the test to give evidence of a definite disturbance of carbohydrate metabolism when none exists.

Acute infections of any kind will cause a temporary disturbance in the glucose tolerance test that may persist for several weeks; hence it should never be done during or soon after recovery from acute upper respiratory infections, boils, carbuncles, *etc.*

No exercise or smoking should be allowed during the test, as these may raise the blood sugar.

Excessive water intake during the test should be prohibited because of the possibility of diluting the blood serum, thereby lowering the blood sugar values.

Technique

The patient is instructed to fast from 6:00 P. M. of the evening before the test until 8:00 A. M. the morning of the test when he presents himself at the laboratory. A fasting blood and urine sample are obtained, then 100 gm. of glucose dissolved in 250 cc. of water are ingested, and blood and urine samples are obtained at intervals of one-half, one, two, and two and one-half hours after the drink.

Interpretations of Results

In order to determine whether a glucose tolerance curve is abnormal one must know normal figures for the method used. Fig. I gives the upper limits of normal as determined by the Gibson micro blood sugar method on venous blood.

Fasting	1/2 Hr.	1 Hr.	2 Hrs.	2 1/2 Hrs.
116	185	172	129	119

Fig. I

Many are the variations of the glucose tolerance test one sees when one does routine tolerance tests on a large series of patients having glycosuria. For purposes of simplicity the more common deviations from normal are given in Fig. II.

	Curve of Slow Absorption	Type I	Type II	Type III	Type IV	Type V
Fasting	90	110	110	120	180	200
1/2 Hour	100	220	220	240	310	350
1 Hour	160	140	190	200	300	360
2 Hours	140	120	160	200	300	400
2 1/2 Hours	88	100	130	160	300	450

Fig. II

Curve of slow absorption: Probably due to failure of glucose to be absorbed into blood stream as rapidly as normal, hence a delayed peak.

Type I—curve of diminished tolerance, showing only initial rise above normal, usually with glycosuria in at least one specimen.

Type II—curve of mildly diminished tolerance and assimilation, usually with glycosuria in one or more urine specimens.

Type III—curve of moderately severe diminished tolerance and assimilation, usually with three or four urine specimens showing glycosuria with or without clinical symptoms.

Type IV—curve of severely disturbed tolerance and assimilation, usually with glycosuria in all specimens and more often than not clinical symptoms.

Type V—curve showing diminished tolerance and practically no evidence of assimilation as the blood sugar is rising at the 2½ hour period.

It is well to remember that Type I may be caused by a boil or carbuncle or some other low grade infection.

Types II and III may be caused by pituitary, thyroid, adrenal dysfunctions, and also by central nervous system lesions, such as tumor, etc.

Types II, III, IV and V may be associated with diabetes; IV and V more commonly.

Finally, it is well to remember if the fasting and 2½ hour blood sugar approximate each other, regardless of the height of the curve, that one is probably dealing with some disturbance in carbohydrate metabolism other than diabetes mellitus.

Conclusions

1. The incidence of glycosuria on routine urine examination is .5 to 2%.

2. Sixteen to 20 per cent of patients showing glycosuria are found to have disturbed glucose metabolism as judged by the glucose tolerance test.

3. Glycosuria may occur in only two conditions regardless of underlying disease:

a. In the presence of a lowered renal threshold for glucose.

b. With an elevated blood sugar, *e. g.*, above renal threshold for glucose.

4. A simple fermentation test to differentiate glucose from other reducing substances is given.

5. Glycosuria should be considered evidence of diabetes mellitus unproved otherwise.

6. Determining whether glycosuria is transient, postprandial, or persistent will aid in determining the severity of underlying disease.

7. Glucose tolerance tests done under carefully controlled conditions are an invaluable adjunct to the early diagnosis of a disturbed carbohydrate metabolism.

8. If fasting and 2½ hour blood sugars are the same, regardless how high the others may go, it is unlikely that diabetes exists.

9. Figures for normal glucose tolerance tests are given.

10. Early diagnosis of diabetes means early treatment with a better prognosis.

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Complications and Management of Pregnancy* And Labor Among Physicians' Wives

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and

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IT IS COMMONLY SAID that physicians' wives have more complications during pregnancy and labor than is usual among average parturient women. We were curious about the truth of this statement, and decided that study of a group of physicians' wives would tend to answer our doubts, and would afford a method of sampling the complications and management in our obstetrical practice over a period of years. Consequently, we have reviewed the records of a consecutive series of 553 confinements among 241 physicians' wives in Rochester, Minnesota. During the same period of time, January 1, 1914, to January 1, 1937, approximately 5,900 confinements were conducted in the section on obstetrics.

The obstetrical service available for the care of these patients may be divided into two periods: the first extending from January 1, 1914, to August 1, 1922; and the second from the latter date to January 1, 1937. The first period started with obstetrical practice in the home; later, several temporary hospital services were established. Since August, 1922, the service has been housed in an adequately-appointed, isolated section of St. Mary's Hospital. During the latter period one or more associates have shared in the conduct of the obstetrical service.

The data from the case records of this series of patients have been examined to determine the relative frequency of conditions complicating pregnancy, labor and the puerperium, and to attempt to determine and discuss certain factors which influence the course of labor, the method of delivery and the risk to the patient. For example, maternal conditions such as contracted pelvis, and fetal conditions such as presentation and position, are factors which influence the course of labor and the method of delivery. Other factors which are largely under the control of the attending physician and which may have a distinct bearing on the outcome of pregnancy and labor are prenatal care; asepsis; the perfection of methods of delivery, including cesarean section, and analgesia and anesthesia.

TABLE I.
Chief Maternal Complicating Conditions

Condition	Pregnancies
Hyperemesis	9
Eclampsia	1
Hypertensive toxemia	8
Nephrosis	1
Pyelitis	10
Secondary anemia	37
Semi-aplastic anemia	13

* Presented before the annual meeting of the North Dakota State Medical Association, held at Grand Forks, May 16-18, 1937.

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Purpura haemorrhagica (splenectomy)	1
Uterine myoma	9
Uterine myoma (degenerating)	1
Appendectomy	2
Subacute appendicitis	2
Gallstones	1
Old pulmonary tuberculosis	1
Active pulmonary tuberculosis	1
Diabetes (1 patient)	4

The chief maternal conditions complicating pregnancy are shown in Table I. For the first five or six years of the practice on which this paper is based, the records of prepartum care were meager; adequate prepartum care is recorded for 472 pregnancies. Readings of blood pressure were recorded in 515 pregnancies. The highest systolic pressure in 33 pregnancies was more than 140 mm. of mercury, in 30 of which it was between 140 and 160 and in three, between 160 and 200. Eight patients had hypertensive toxemia, and one had a brief postpartum eclamptic convulsion. One patient had acute nephrosis without hypertension. In the remaining cases of hypertension, 24, there was no other evidence of toxemia or of chronic arterial or renal disease.

Only nine patients required special care in the home or hospital for hyperemesis, possibly because those with mild symptoms reported early for treatment. Although it is not within the scope of this paper to record details of treatment, it may be stated that mild hyperemesis is almost always controlled by frequent small meals of bland food, avoidance of physical or mental strain, administration of mild sedatives, and much reassurance. The reasons for the low incidence of preëclamptic toxemia are not clear, although the early and full co-operation of the majority of patients in following prepartum advice may help to explain it. Increase of blood volume during pregnancy dilutes the hemoglobin and causes relative anemia. A diagnosis of secondary anemia was not made unless the concentration of hemoglobin remained 12 mg. per 100 cc. (about 70 per cent), or below, on several readings. There were 37 such cases and 13 cases of semi-aplastic anemia; in 165 pregnancies there was evidence of a distinctly lowered percentage of hemoglobin. The spleen of one pregnant woman was removed for hemorrhagic purpura without interfering with the course of pregnancy or labor. Diabetes, even though it is ordinarily controlled by diet and insulin, is a distinct complication to both mother and fetus.

TABLE II.
Conditions Which Complicated Labor but Which Were Not Associated With Dystocia

Condition	Pregnancies
Placenta praevia	2
Premature partial placental separation	3
Hydramnios	3
Polyhydramnios	1
Prolapse of umbilical cord	1
Prolapse of umbilical cord (occult)	2

Retained placenta	5
Postpartum hemorrhage	10
Postpartum hemorrhage (1000 cc.+)	1
Hemorrhage from lacerated cervix (severe)	1
Diabetes (1 patient)	4
Uterine fibromyoma	10
Bicornate uterus	5

In Table II are shown conditions complicating labor but not associated with dystocia. Some of these conditions, such as diabetes and uterine myoma, may complicate both pregnancy and labor. In most instances, the fibromyomas caused no untoward symptoms during pregnancy, nor any difficulty during labor. The bicornate uterus appears to have less effective expulsive contractions than the normal uterus. The potential seriousness of most of the other complications is evident. The amount of blood lost in postpartum hemorrhage was estimated, rather than measured. The placenta was removed manually in four instances and in one a pack was placed in the uterus. The incidence of five retained placentas seems somewhat high. When pituitrin was introduced as an oxytocic drug, the most favorable time for its use in the third stage of labor was not known, and in some instances its injection several minutes after, rather than directly after termination of the second stage seemed to have disturbed the normal mechanism of separation and expulsion of the placenta.

TABLE III.
Major Complications of the Puerperium

Complications	Pregnancies
Puerperal infection (no septicemia demonstrated)	2
Phlebitis	2
Retained lochia with fever	1
Breast abscess	3
Pyelitis	5
Bronchopneumonia	1
Influenza	2
Perirectal abscess	1
Hematoma of rectovaginal septum	2
Rectovaginal fistula	1
Thoracic laminectomy for cord tumor	1

The major complications of the puerperium are shown in Table III. There may be a difference of opinion concerning the advisability of catheterization for retention of urine in the bladder during the puerperium. It has been said that the catheter should not be used unless the urine is retained for more than 24 hours. Our procedure has been to catheterize the bladder if it cannot be emptied by the patient within eight to 12 hours after delivery. We believe this lessens the likelihood of continued retention of urine and of postpartum infection of the bladder. Two to four cc. of one per cent solution of silver nitrate are instilled into the bladder after every second catheterization during the puerperium. In one instance, however, pyelitis which had its onset in the puerperium, was thought to be attributable to repeated catheterization for urinary bladder retention. Little comment need be made on the remainder of these complications. The occurrence of an occasional abscess of the breast several years ago was responsible for a rule on the service to discontinue nursing at the breast immediately following the appearance of any soreness or cracking of the nipples. Except for cleansing with soap and water immediately postpartum, the nipples are treated with sterile mineral oil and covered with a sterile gauze sponge after each nursing. There was no alarm-

ing morbidity, and there were no deaths in the entire group of 553 pregnancies and confinements.

When these cases are considered as a series scattered over more than 20 years, it seems partly a matter of good fortune that no more serious trouble has occurred. However, since several patients had puerperal infection and since puerperal infection is the largest single cause of obstetrical morbidity and mortality in the United States, as shown by the United States Bureau of Vital Statistics, it is proper to restate simple principles of aseptic procedure. Confinements in the home occur in an environment to which the patient has developed some measure of immunity. Relative asepsis of the actual field of delivery can be controlled, and vaginal examinations and manipulations, which require that the vagina be entered, can be reduced to the minimum of necessity. In hospital practice, careful aseptic technic, with its accompanying procedures of preparation of the field and use of sterile draping, gowns, masks, gloves and so forth, should render remote the possibility of infection. In spite of these precautions infections may occur and especially if operative procedures cause trauma to the tissues. Rectal examinations, with gloves used only for this purpose, usually will allow determination of the progress of labor. Exceptionally, vaginal examinations are made under the conditions previously noted.

There was some degree of pelvic contraction in 81 of 553 pregnancies; in 20, there were flat pelvises; in 16, generally contracted pelvises; in 13, pelvis of the funnel type; in 31, some contraction of the outlet and in one, oblique contraction attributable to congenital deformity of the hip. Many of the contractions were mild in degree, particularly those classified as general or contractions of the outlet. The presentation of the fetus was vertex in 521 pregnancies, in 67 (13.6 per cent) of which the position was occiput posterior; breech presentation was found 25 times (external version was successful in six cases prior to labor), and face presentation once. No record was made of the presentation in most of the 22 cases in which cesarean section was performed or in a few of the confinements of the early period. There were eight sets of twins, a total of 561 births in 553 confinements.

There is a growing tendency toward interference with the duration of normal pregnancy by mechanical induction of labor, chiefly by means of rupture of the amniotic sac. Somewhat more than 15 years ago, we became concerned about some patients whose gestations became apparently postmature, and sometimes we induced labor for this condition by insertion of a dilating bag into the cervix or by rupture of the amniotic membranes. Certain difficulties of labor encountered in some of these cases led us to narrow greatly the indications for employment of these procedures. Castor oil and quinine were used for medical induction, but more recently a pituitrin product has been substituted for the quinine; this is a modification of the method described by Watson. The indications for induction of labor and the methods used are found in Table IV. In some cases

TABLE IV.
Induction of Labor

Method	Pregnancies
Insertion of bag into cervix	14
Artificial rupture of membranes	10
Castor oil and quinine	48
Castor oil and pitocin	13
Indications:	
Postmaturity	14
Pelvic contraction	14
Toxemia	6
Election	52
Hydramnios (twins)	1
Diabetes	1

there was more than one indication for induction. The advisability of induction of labor for convenience of the patient is subject to question. It has not been our policy to suggest induction of labor except for obstetrical indications. I do not know of any real contra-indication to the medical induction of labor at or beyond the normal period of gestation except the disappointment and inconvenience to the patient when it fails. When it was proposed by the patients in this series, it was often discouraged but seldom refused.

The operative deliveries are shown in Table V. In

TABLE V.
Operative Deliveries

Method of Delivery	Pregnancies
Forceps—	
Low	83
Mid	18
Rotation	4
Breech deliveries	16
Breech; forceps to after-coming head	3
Manual rotation vertex and spontaneous	4
Manual rotation and forceps	10
Podalic version and extraction	3
Craniotomy (hydrocephalus)	1
Abdominal cesarean section	21
Abdominal cesarean section (Porro)	1

cluding 16 breech deliveries, 412 births were spontaneous, 126 were vaginal operative deliveries and 23 infants (one set of twins) were delivered by abdominal section. Including cesarean section, in approximately 25 per cent of this series of pregnancies, delivery was by operative measures, which is about five to seven per cent higher than our usual yearly average. When should operative measures be used to effect delivery? Should one refrain from interference except for arrest of progress, maternal exhaustion, fetal distress or complications such as prolapse of the cord or hemorrhage? Anesthesia during the second stage of labor, and increasing degrees of analgesia, cause an increase in the incidence of labor for which interference becomes necessary. What is the proper balance between relief of pain and the method of delivery? The above questions and more may be asked. The incidence of operative deliveries is somewhat higher in this series of cases than is the average incidence for our patients. The factors of nutritional diseases of childhood and of race may influence the difficulties of labor. Probably all or nearly all of these patients were reared under favorable nutritional conditions, their geographic origins were fairly representative of the present birth registration area of the United States. Were there more operative deliveries in this series than is usual because most of this group of patients was less accustomed to physical work prior to and during marriage than the average parturient woman? Nutritional factors being equal, statistics indicate that the majority of women who must of necessity do daily, ar-

duous physical work have the highest incidence of spontaneous deliveries.

Other operative procedures incidental to labor are shown in Table VI. Episiotomy and immediate repair are in general use. Comment may be made that the

TABLE VI.
Other Operative Procedures

Procedure	Pregnancies
Episiotomy and repair; spontaneous delivery	173
Episiotomy and repair; operative delivery	72
Perineal laceration and repair	51
Completion of dilatation of cervix manually	6
Incisions of cervix (Dührssen)	1

gynecologist is not often consulted for cystocele and prolapse by women whose labors have been accompanied, when necessary, by satisfactory episiotomy and repair.

The indications for the abdominal cesarean sections are shown in Table VII. Cesarean section was performed in 3.9 per cent of the 553 confinements. If the seven cesarean sections performed on women who were not residents of Rochester are excluded, cesarean opera-

TABLE VII.
Cesarean Section

Indication	Operations*
Placenta praevia	1
Funnel pelvis (3 patients had 2 cesarean sections each)	6
Flat pelvis (1 previous stillbirth due to dystocia)	3
Generally contracted pelvis	3
Cervical dystocia; protracted labor (twins)	1
Elderly primiparas, ages 39 and 40	2
Previous dystocia (2 stillbirths)	1
Chronic mitral endocarditis with stenosis	2
Uterine fibromyomas (Porro)	1
Diabetes (previous stillbirths)	1
Cord tumor	1

* Seven performed on nonresidents.

tions were performed in 2.7 per cent of the total confinements. The patient who had chronic mitral endocarditis and stenosis, who underwent two cesarean operations, had a definite break in cardiac compensation in the last trimester of the first pregnancy. The patient with cord tumor had the onset of rapidly progressive symptoms late in pregnancy. We do not advise cesarean section for elderly primiparas except when considerable doubt arises about the adequacy of the birth canal. Cesarean section gave the diabetic patient one living child out of four confinements.

The fate of the fetus is shown in Table VIII. The total fetal mortality given in Table VIII was 3.9 per cent, and this is corrected to 2.4 per cent if the pre-

TABLE VIII.
Record of Infants

Date of Infants	Infants
Live births; babies lived	539
Premature stillbirths	6
Premature neonatal deaths*	6
Full term stillbirths, præpartum	2
Full term stillbirths, intrapartum**	3
Full term neonatal deaths*	5
	22
	561

Total (8 sets of twins)
Total fetal mortality—3.9 per cent

* Includes 10 days, the usual duration of patient's hospitalization.

** One craniotomy for hydrocephalus.

mature and præpartum stillbirths are excluded. All premature births after more than 26 weeks of gestation are included.

The widespread use of analgesics during labor justifies a word relative to their use in this series. Morphine, and occasionally chloral, were used in many of the early

cases. Later, use of these drugs was supplemented for a period of several years by intramuscular injection of two cc. of a 50 per cent solution of magnesium sulphate. The occasional use of scopolamine did not produce sufficiently satisfactory analgesia to justify its continuance; possibly the technic of its use was not completely mastered. Colonic oil ether analgesia, advocated by Gwathmey, was found to be especially useful in protracted labors, such as those of primiparas with the occiput in the posterior position. About ten years ago, derivatives of barbituric acid were introduced on our obstetrical service, and have been in use since that time. Of these, pentobarbital sodium has been the most satisfactory, the dosage averaging about $4\frac{1}{2}$ grains (0.27 gm.) during the course of labor. If further analgesia is necessary, sometimes morphine sulphate is used and occasionally colonic oil ether: complete analgesia and amnesia are not sought, although these sometimes follow even the smaller doses. Some form of analgesia has been used in 278 labors, chiefly during first labors, and has given reasonable analgesia in about 70 per cent of these. Drop ether anesthesia was used almost exclusively for more than ten years. This was superseded by nitrous oxide and oxygen anesthesia complemented by ethylene, carbon dioxide and ether vapor when indicated.

Comment

The four most important advances in the management of pregnancy and labor during the past century have been: (1) prenatal care, (2) anesthesia and analgesia, (3) asepsis, and (4) the perfection of methods of operative delivery, including abdominal cesarean section. Application of prepartum examination and care have been followed by distinct lowering of the relative number of severe cases of toxemia and of eclampsia among the patients who have had this care. Knowledge of the physical condition and pelvic measurements of patients have been of distinct assistance to the physician attending their confinements.

It seems paradoxical to say that the injudicious use of anesthesia and of methods to relieve pain probably are responsible more than any other factors for the failure of modern obstetrics to lower appreciably maternal mortality. When properly employed, the value of operative methods of delivery, including cesarean section, is unquestioned; improperly employed, they are a distinct hazard. The principle of asepsis is by far the most important advance in obstetrical practice, but as yet the death rate from puerperal sepsis has not been lowered. In 1915, the maternal mortality for the birth registration area of the United States was 61 per 10,000 live births; in 1934, it was 59 and for both years the mortality from puerperal sepsis was 24 per 10,000 live births. Why should relief of pain in labor influence unfavorably maternal morbidity and mortality? Following its discovery and for many years afterward, anesthesia was employed to relieve the pain occasioned by the passage of the fetus through the vaginal outlet. Gradually the duration of the anesthesia has been extended to include more or less of the second stage of

labor, and its use has made possible extension of the scope of operative methods of delivery. The introduction of aseptic methods has enabled the physician to employ these operative measures with a reasonable sense of security from infection.

It would seem evident that anesthesia and aseptic measures offered ideal conditions for the use of operative aid to the parturient woman, when the need for this became necessary. If relief of pain in labor is considered from a world-wide standpoint, it is evident that methods for this relief are most highly developed in those countries in which women are more nearly on a plane of political, social, and economic equality with men. Woman demands easement of pain in labor, and many women will not employ the physician who is not prepared to give some measure of relief. Relief of pain is proper, but the relief of pain in labor should be commensurate with the safety of both mother and infant. Analgesia and anesthesia mean much to the parturient woman; asepsis adds to her safety, yet the lagging of expulsive power caused by drugs used to produce these effects, and the reliance of the physician on asepsis may lead him to subject the parturient woman to operative delivery which would not have been necessary if the anesthesia or analgesia had been less nearly complete. In the report made before the New York Academy of Medicine several years ago of the analysis of maternal deaths for a three-year period in the City of Greater New York, the pertinent statement was made that the lessening of expulsive power from the increased use of anesthesia led to frequent operative deliveries to which many maternal and fetal deaths may be attributed.

The ideal analgesia and anesthesia should be safe for both mother and infant and should not interfere with the efficiency of uterine contractions or with the coöperation of the patient to such a degree as to increase, to an appreciable extent, the number of operative deliveries. Within recent years many articles by competent obstetricians have appeared in medical journals reporting large series of confinements conducted under complete or almost complete analgesia; each has shown a marked increase of operative deliveries without unfavorable results. The competence of these obstetricians and the fairness of their reports are not in question. The point may be raised that some physicians, whose obstetrical experience and ability may be somewhat limited, are persuaded to carry out the same procedures under less favorable conditions.

The advisability of the use of a safe and reasonable degree of analgesia and anesthesia during labor is not questioned. Analgesics are useful in many confinements and, in moderate dosage, sufficient to give the woman rest between pains, usually will help to prevent the exhaustion which may accompany protracted labor.

There is also a trend toward reduction of duration of pregnancy by the mechanical induction of labor. This procedure, as well as the practice of shortening of labor by drugs or operative delivery, for convenience, cannot fail to increase the maternal and fetal risk, if commonly adopted.

The Dietary Regimen in the Treatment of Renal Calculi

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EXPERIMENTAL observations demonstrating the relationship between the formation of renal calculi and a diet deficient in vitamin A have been described by Osborne and Mendel¹, McCarrison², Fujimaki³, Van Leersum⁴, Perlmann and Weber⁵ and the author⁶. Present clinical observations tend to substantiate these experimental observations.

A few years ago, when this relationship was pointed out, some authors stated that there was a lack of evidence to indicate that deficiency in vitamin A existed among the people of this country. However, information is gradually being accumulated which indicates that mild degrees of vitamin A deficiency are more prevalent among the American populace than we have been led to presume. Dr. W. J. Ezickson and J. B. Feldman⁷ in 1937, by employing the dark adaptation or light sensitivity test, found that of 25 patients with urolithiasis 24 had pathologic dark adaptation varying from a mild to a severe degree. In a control group of 50 patients who were free from urolithiasis and were either normal individuals or had extra-urinary lesions, the dark adaptation test gave normal findings except for one patient with myxedema, one with juvenile diabetes, and two with jaundice. The group of patients with lithiasis consisted of 16 white men, eight white women, and one negress, the ages of the patients varying from 14 to 62 years.

In a group of individuals studied at the Cleveland Clinic, 68 or 72 per cent of the patients with renal calculi had a positive result from the biophotometer test of vitamin A deficiency. In the majority of our cases, the test showed normal results when adequate amounts of vitamin A were restored to the diet. This is in contrast to the observation of Ezickson and Feldman who found that 14 of 15 patients returning for recheck continued to show pathologic dark adaptation and only one showed improvement.

McCarrison² previously had stated that urinary stones were so prevalent in certain regions of India that these were designated as stone areas. He noted this frequent occurrence of calculi in regions where the diet of the inhabitants was definitely deficient in some way.

Joly⁸ in a similar clinical survey of calculous disease in England has stated, "In a universal survey of calculous disease, it is obvious that stones are more prevalent among people who live on a poor, monotonous diet, principally composed of carbohydrates than among those who partake of good and varied food."

Noble⁹, in Siam, found the largest number of stones in the poorer classes who lived in the agricultural dis-

tricts and the greatest incidence occurred in the first ten years of life. He states, "There is no doubt that the children who suffer from stone have had a diet deficient in vitamin A."

Jeghers¹⁰ similarly has stated, "More important, however, was the demonstration of the frequency of the clinically detectable vitamin A deficiency. He studied a group of 162 students attending Boston University School of Medicine and found that approximately 35 showed photometric evidence of vitamin A deficiency while 12 showed clinical evidence. Jeghers also noted that the factors responsible for producing the deficiency had been present for months and in some instances for years.

Youmans, in discussing Jegher's paper, stated that in using a similar photometer he found subnormal dark adaptation in one-half of 50 clinic patients, the diets of many of whom were thought to be inadequate. A similar observation was made in 11 of 54 supposedly normal subjects whose diets appeared to be well balanced.

Vermooten¹¹ recently has stated that renal calculi do not form in the South African Negro as illustrated by his study of 1,091,000 negro patients admitted to his hospital. Members of the white population of South Africa do, however, have renal calculi in the ratio of one in 460 admissions. He states that the negro lives on a diet which is rich in vitamin A, has an acid-ash base, and is low in calcium.

Jeans¹² in 1936 utilized the photometer test for detecting vitamin A deficiency. In a study of 100 children of middle and low economic levels in a rural community, he observed that 26 per cent had a positive test of vitamin A deficiency. Of 102 children of all economic levels in a village, 53 per cent presented similar evidences. Of 70 children of upper economic levels in a city, 56 per cent gave a positive test of vitamin A deficiency and of a group of 70 children of middle economic levels in the city, 63 per cent gave a positive test. In a study of 62 children of low economic level in a city, it was noted that a positive curve of vitamin A deficiency was observed in 79 per cent. Of 78 village and city children who had a positive test of vitamin A deficiency and to whom adequate amounts of vitamin A were administered, all but three developed a normal adaptation to darkness after the period of vitamin A therapy.

Boshamer¹³, has stated that the various surgeons who operate in central parts of Southern China as well as Siam and Indo-China have been impressed by the frequency of calculous disease during the second to fourth

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decades of life. He stated that bladder stones from the size of a cherry to that of an apple were met with and that they were single or multiple. Ureteral calculi were also encountered frequently. Boshamer stated that, almost without exception, patients suffering with stones belonged to the poorest grade of society and he emphasized especially the frequency of vesical calculi in Kwangsi where he works. He believed that this was due to the fact that this is the poorest province of China, the diets of these poor people being comprised mostly of boiled, polished rice. Milk, fruit, meat, and vegetables were only occasionally consumed and then in small amounts. Kidney stones, on the other hand, occurred in the richest classes and, in these cases, chemical examination of the stones showed them to be composed of urates. Soldiers during war times also had definitely deficient diets, rice forming the major portion of the food, thus resulting in deficiency of not only vitamin A but of vitamin B also. Boshamer cited an extremely interesting case in which the patient was operated upon for vesical calculi three times during a five year period. Recurrences developed soon after operation in each instance. When the patient came to Dr. Boshamer, it was noted that the diet was deficient in vitamins. After the final operation, the diet was adjusted so that it contained milk, vegetables, fruit, and eggs. This regimen was followed in a short time by disappearance of the inflammation of the bladder and no more urinary calculi developed. It was also stated, that, in this individual, there was no organic obstruction to the outflow of urine from the bladder.

Meltzer¹⁴ in 1937 cited a case of alkaline encrusted cystitis which was cured by a regimen of vitamin A therapy and acidification of the urine. This, he stated, undoubtedly played the greatest rôle and secondly came the use of an indwelling catheter which permitted frequent irrigations, dilatations, and rest of the bladder.

These clinical results again support the experimental work and observations that calculous formations in the urinary tract may be caused by a diet deficient in vitamin A.

There is little doubt, however, that more than one factor may be responsible for the formation of renal calculi.

Rosenow and Meisser¹⁵ have experimentally demonstrated the rôle of focal infection.

Barney and Mintz¹⁶, Albright¹⁷, and others have stressed the rôle of hyperparathyroidism. Barney and Mintz believe that this factor is responsible for 4 or 5 per cent of all cases of urinary stones, while the percentage of calculi in the presence of this disease may be almost 70 per cent.

Hunner¹⁸ has emphasized the rôle of ureteral stricture and stasis.

Keyser¹⁹, Rovsing²⁰, and others have pointed out the importance of infection.

Therefore, in the urologic investigation of a patient with urolithiasis, all these factors must be considered and their absence or presence noted. For this reason,

I have used during the past five years the following routine in examining patients with calculous disease.

A careful history is secured to elicit whether inadequacies in the diet exist or whether there is a 'familial' history of calculous disease such as frequently occurs in cystine lithiasis. Similarly, information may be imparted by the patient which may be of additional significance in regard to the etiologic factors.

A thorough physical examination is then performed. Careful palpation of the neck is advisable as a parathyroid tumor may be detected.

Complete study for foci of infection is made; this includes examination of the teeth, tonsils, sinuses, cervix, and prostate.

An initial roentgenogram follows to determine the presence or absence of renal calculi and coexisting stones in the ureter or bladder.

Following this, a cystoscopic examination is made. This includes visualization of the bladder and examination of a specimen of the bladder urine. Catheters are then passed to the kidney pelvis and urine is collected for routine study and to determine the type of crystals present, the pH, and culture. A specimen is taken for a stained smear of the sediment, and an additional specimen is sent to the laboratory to determine whether the organism has the power of splitting urea.

This is followed by a phenolsulphonephthalein function test.

The following day, after the spasm of the ureters due to the passing of the ureteral catheters has subsided, an intravenous urogram is secured. This is an additional test of renal function and also demonstrates the absence or presence of stasis.

Studies of the blood should include counts of the cells, complement fixation test, determination of the levels of the sugar, urea, nonprotein nitrogen, calcium, phosphorus, uric acid, and phosphatase. If there is an elevation of the calcium and a lowering of the phosphorus, attention is attracted to the possible presence of hyperparathyroidism. In such cases, further roentgen study of the bones and a study of the elimination of the calcium in the urine are made.

If a calculus has been passed spontaneously or is removed surgically, its chemical constituents are determined.

The postoperative routine consists of the following measures:

1. A roentgenogram of the kidneys and an intravenous urogram are secured before the patient is dismissed from the hospital. This demonstrates whether stasis is present or whether a small fragment might have been overlooked. I believe, however, when multiple or staghorn stones are being removed surgically, a roentgenogram should be obtained at the time of operation to avoid overlooking small stones or fragments of calculi.

2. Eradication of focal and local infections.

3. Treatment of hyperparathyroidism. If present, surgical intervention may be necessary.

4. Elimination of stasis.
5. Correction of metabolic errors.
6. Correction of vitamin A deficiency.
7. Correction of vitamin B deficiency.

8. Dietary adjustment of the pH of the urine, depending upon the chemical constituents of the calculus and the pH of the urine from the kidney which harbored the calculus. No one diet is applicable for all patients and individual adjustment of this part of the postoperative routine is, we believe, of inestimable value. In addition, if the calculus is composed of uric acid or cystine, the foods should be low in purines or purine-free if possible. If it is composed of oxalates, a restriction of foods which are rich in oxalates is advisable.

The present status of the dietary regimen in the treatment of urinary calculi was presented in the *British Journal of Urology* in March, 1937, and before the Urological Section of the American Medical Association in 1936, but apparently some confusion still exists as to the indications and results which have followed use of this procedure.

First, it must be emphasized that this is only an additional procedure to be utilized with other well established methods for the prevention of calculi or recurrence of calculi.

In view of the fact that the majority of renal calculi produce some degree of obstruction in the calix or pelvis of the kidney, relatively few patients can be treated conservatively; yet series of cases have been described in the past in which conservative treatment was employed and treatment even continued when there was evidence of enlargement of the calculus. Clinical judgment should obviously indicate that conservative treatment should not be continued under such circumstances. In view of this fact, I wish again to present our views which, as stated previously, were cited in 1936 and 1937.

Bilateral Renal Calculi: In this group of cases, conservative treatment by dietary means has not given satisfactory results. In the majority of the cases I have seen, infection, stasis, and impaired renal function have been present. In several instances, a bilateral infection with the *Proteus* organism has been present and it was impossible to shift the pH of the urine to the acid side. Obviously, if this cannot be accomplished, the calculi will continue to enlarge as the alkaline salts continue to be precipitated. If the patient's condition does not justify surgical intervention, I have no hesitancy in prescribing the acid- or alkaline-ash diet, whichever may be indicated, in the hope that the pH of the urine can be adjusted to the point where precipitation of the urinary salts does not occur and the growth of the calculus may be retarded.

In instances of *large calculi* requiring nephrectomy, as I pointed out previously, due to the coexisting renal infection, stasis, and poor renal function, satisfactory results cannot be secured. Nephrectomy is advisable and dietary control instituted to minimize the possibility of a calculus developing in the opposite kidney.

In two of our cases, however, marked fragmentation of the calculus did occur.

Calculus in the Pelvis or Calix of the Kidney Which is not Producing an Obstruction: Unfortunately, the majority of the calculi produce varying degrees of obstruction and stasis, as evidenced by urographic study by the intravenous method. As damage to the renal parenchyma is evident, conservative treatment is not advisable. In a small percentage of cases, however, there may not be any evidence of obstruction or stasis and, in these instances, I believe conservative treatment may be instituted if the patient is kept under close supervision. Recently at the meeting of the Southwestern Branch of the American Urological Society, a case was demonstrated in which three stones in the kidney had undergone dissolution by the use of the acid-ash diet. However, the urogram presented by the urologist revealed very little evidence of stasis. Therefore, clinical judgment must be employed in reaching a decision regarding utilization of the diet in this group and it should not be advocated indiscriminately.

There are, however, three groups of cases for which I believe the diet should be utilized:

1. **The Prevention of Recurrent Renal Lithiasis:** Up to the year 1932, our incidence of recurrence was 16.4 per cent, but, by the use of the high vitamin A acid- or alkaline-ash diet in conjunction with procedures we employed previously, we have reduced it to 4.7 per cent at the present time. These patients were Clinic and not dispensary patients; the latter may be difficult to handle from the economic or coöperative standpoint. Our patients were kept under close supervision, either by us or by the referring physician. Braasch has stated that calculi recur most frequently during the first two years following operation and we concur with this opinion, especially since making a review of the last one hundred patients who came to the clinic because of urinary calculi, and we feel quite optimistic regarding the permanent prevention of recurrence by use of this regimen if the pH of the urine can be controlled.

2. **Prevention of the Formation of Calculi in Patients Who Pass Small Stones at Frequent Intervals but in Whom a Calculus is not Demonstrable in Either Kidney:** In this group of patients, determination of the chemical constituents of the calculi which have been passed is of considerable importance as well as a study of the pH of the urine from each kidney. I believe satisfactory results may be secured and the incidence of calculus formation minimized by shifting the pH of the urine to a point at which the salts which comprise the calculus are maintained in complete solution.

3. **Prevention of the Formation of Calculi in Patients With Orthopedic Problems:** A review of the literature reveals that the formation of a renal calculus in a patient required to remain in the recumbent position for a long period of time is not an unusual occurrence. In the majority of cases that have been reported in the literature, the calculus was composed chiefly of calcium phosphate, a salt which precipitates in alkaline urine.

Therefore, in this group of patients, the high vitamin A acid-ash diet is prescribed, the pH of the urine being maintained at a point at which the alkaline salts are held in solution. I believe that alkaline urinary antiseptics should not be employed here as the pH of the urine is shifted to the alkaline side and precipitation of phosphates and carbonates enhanced.

Conclusions

1. A careful search for etiologic factors associated with the formation of the primary renal calculus is necessary to minimize the development of a recurrent calculus.

2. Indiscriminate use of the acid- or alkaline-ash diet in the treatment of patients with renal calculi should be avoided.

3. Control of the pH of the urine by dietary means in addition to our other procedures is of value in preventing the formation of true recurrent calculi.

4. The operative removal of a calculus is but one phase in the management of a patient with renal lithiasis and a carefully followed postoperative regimen is necessary.

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Hypertonic Dextrose Solutions In the Treatment of Bronchial Asthma

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GENEROUS amounts of sugar and sweets have been recommended by some physicians in the treatment of bronchial asthma. The carbohydrate has been administered either by vein or by mouth. One of the first reports in the literature concerning this form of therapy was that of Shafir¹, who successfully treated fourteen patients. These patients ranged in age from 16 to 48 years, with the duration of the asthma from 2 months to 7 years. A 20 per cent solution of grape sugar was employed, and 10 cc. were administered intravenously daily for 6 to 20 days.

A few years later Osman² reported his experiences with large amounts of sugar in the form of dextrose (glucose) in the treatment of asthma in children. The majority of his subjects were undernourished children. The glucose was given orally, and as the children gained

in weight their asthmatic attacks became less frequent.

The authors' first experience with the use of dextrose in the treatment of asthma was in connection with a case of asthma due to food allergy reported in 1932.³ The patient was somewhat refractive to epinephrine, but responded very well to the intravenous administration of 200 cc. of a 25 per cent solution of dextrose. It was found that recurrent attacks of asthma could be checked by the oral administration of four to eight ounces of a 50 per cent solution of the sugar. Matzger⁴ recommended hypertonic solutions of dextrose to be given to adults for the relief of attacks of asthma when other measures failed. He found 500 cc. of a 20 or 25 per cent solution, or 1000 cc. of a 10 per cent solution, to be beneficial.

Lepak⁵ reported similar results, but used more concentrated solutions of the carbohydrate. He treated four cases of bronchial asthma secondary to an upper respiratory infection with an intravenous administration of a

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50 per cent solution of dextrose. Various amounts were tried, and the best results were obtained with 50 to 100 cc. of the sugar solution given consecutively for 2 to 3 days. The intensity as well as the frequency of the asthmatic attacks was definitely reduced.

The value of these favorable reports has been offset by the unpublished communications from physicians who have not had encouraging results with the use of dextrose in the treatment of bronchial asthma. Some of their patients have shown no response, others have been made temporarily worse. This irregularity in the response to the dextrose may be explained in part by the experiences encountered in the treatment of the following patients. All were very closely observed.

Case One (A. C.) was a girl twelve years of age with a history of asthmatic attacks since the age of four years. Before the age of four she had been chiefly troubled with eczema. Certain foods were considered the causative agents of the asthma. Eggs, fish, peas, and nuts produced the most marked reactions. The family history revealed the fact that the father had slight asthmatic attacks, and the mother had a dry, scaly skin. Three sisters in good health have neither eczema nor asthma. Two brothers, on the other hand, have eczema.

The physical examination showed the patient to be a well-developed and well-nourished child. The skin revealed some eczema, most marked on the exposed parts of the body. The tonsils had been removed. The chest was slightly barrel-shaped, and although percussion did not yield any degree of emphysema, auscultation showed that the patient had the typical asthmatic wheezing respiratory sounds. Roentgenogram examination revealed the right maxillary sinus to be smaller than the average size with slight thickening of the mucous membrane. The lungs were negative.

The asthma was not easily controlled with epinephrine (1-1000 solution). Fifteen minims administered intramuscularly gave relief to the child for only a short period of time. A 25 per cent solution of dextrose was given intravenously and the patient responded very satisfactorily. This preparation was used repeatedly, and the amounts employed ranged between 150 and 200 cc. The asthmatic attack was stopped immediately by the administration of dextrose, and although the epinephrine could be given in less than a minute, the patient preferred the intravenous therapy even though it required 20 to 30 minutes, because it was more effective and the excitability produced by epinephrine was absent. Other hypertonic solutions were not effective. The introduction of 100 cc. of a 5 per cent solution of sodium chloride by vein did not influence the asthmatic attacks.

Case Two (M. M.) was a girl ten years of age with a history of asthmatic attacks since the age of two and one-half years. The child had had eczema for eight months during the first year of life and then following an attack of broncho-pneumonia early in childhood, the asthma appeared. Sensitivity to egg, milk, wheat, oatmeal, peanut, feathers, house dust, cottonwood pollen and ragweed pollen was found. Egg white, feathers, and

house dust produced the most severe attacks of asthma. The family history revealed that only a paternal uncle had had many attacks of urticaria. The child's parents and brothers and sisters have never shown any allergic manifestations.

The patient was fairly well-developed and the nutritional state was fair. The tonsils were absent. The chest was barrel-shaped. Percussion yielded hyper-resonance and on auscultation the wheezing respirations of asthma with a few râles were heard. Roentgenogram study revealed bilateral maxillary sinusitis, emphysema, bronchitis and some bronchiectasis. A later examination after a lipiodol instillation did not confirm the diagnosis of bronchiectasis.

The child's asthmatic attacks were not satisfactorily controlled with epinephrine. More than 5 minims was not well-tolerated and that small dose gave relief for only one hour. Therefore, a 25 per cent solution of dextrose was tried. When 200 cc. was injected intravenously, the patient was relieved for a little over one hour. Then, in view of the fact that the child had improved on a low salt diet, sterile distilled water was employed in place of physiological saline in the preparation of the dextrose solution. The response to 200 cc. of a 25 per cent solution of dextrose in sterile distilled water given intravenously was quite satisfactory. For a period of approximately sixteen hours the child was comfortable and required no epinephrine. This intravenous preparation was repeated several times and in each instance a fairly long period of relief from asthmatic attacks was obtained. The patient did not receive any sodium chloride intravenously, but instead was given a 25 per cent solution of sucrose in sterile distilled water. After approximately 50 cc. had entered the vein, the child became cyanotic. The procedure had to be stopped and epinephrine was given immediately. A second attempt to give the sucrose solution precipitated a severe attack of asthma with cyanosis.

Case Three (H. B.) was a boy twelve years old with bronchial asthma since the age of four years. Infantile eczema and urticaria had been present during infancy and early childhood. The boy was found to be sensitive to egg, cereals, beans, and to the pollens of maple, cottonwood, elm, oak, pigweed, Russian thistle and sage. Egg white, maple tree, and cottonwood pollen produced the most marked and prolonged reactions. The family history was negative for any allergic diseases.

Examination of the child revealed a white boy small in development and fairly well nourished. Posture was poor, due to a barrel-shaped chest and a congenital dislocation of the left hip. The tonsils had been removed. Percussion of the chest showed hyper-resonance and auscultation yielded the typical asthmatic wheezing respiratory sounds with an occasional râle. Roentgenogram examination revealed bilateral maxillary sinusitis and bronchitis.

The patient averaged twelve attacks of asthma each day and responded poorly to epinephrine (1-1000 solution). Intravenous administration of dextrose was recommend-

ed, and the first solution was prepared with a physiological saline. After 200 cc. of a 25 per cent solution had been given, the child had relief for approximately five hours. The same amount of dextrose was then dissolved in sterile distilled water and when this preparation was administered intravenously, the boy's asthmatic attacks were reduced to an average of four each day. A 25 per cent solution of sucrose was also tried, but each time this sugar produced an asthmatic attack with cyanosis one-half hour after administration, and large doses of epinephrine were required in order to give the patient relief.

Comment

The foregoing experiences concerning the treatment of the three cases of bronchial asthma permit interesting observations to be recorded. The patients were all in the same age group. All had had asthma for an average of seven to eight years, and in each case it had been preceded by infantile eczema. The allergens to which the children were sensitive could be demonstrated by cutaneous testing. The asthmatic attacks were caused by ingestants in Case One, by ingestant and inhalants in Case Two, and by ingestant and pollens in Case Three. The physical findings in each case were practically the same, although there was some indication that infection was also present in the last two cases. Râles were heard on auscultation, and the roentgenogram studies revealed bronchitis. All the patients responded poorly to epinephrine. Frequent doses were required, and if the dosages were increased in order to control the asthmatic attacks more satisfactorily, the children became quite ill and showed great excitability. The poor response to epinephrine prompted the use of dextrose as a therapeutic measure.

Case One was very easily relieved by the dextrose solution. Here the asthmatic attacks were due to foods only. The intravenous administration of the dextrose solution was followed within a short period of time by a complete cessation of the asthmatic attack. A return of the asthma could be stopped by the oral use of dextrose in concentrations greater than those used for the intravenous administration. When the food allergens capable of causing the asthmatic attacks were fed to the child, and the dextrose was given simultaneously, little or no asthma appeared. It seemed apparent, therefore, that dextrose was highly efficacious in preventing and controlling asthmatic attacks due to the food allergy. Furthermore, it is interesting to note that the patient was free of any secondary infection. Between attacks of asthma, the chest was clear and the roentgenogram study was negative.

Case Two did not respond satisfactorily to the intravenous administration of dextrose. Oral use of the sugar had no demonstrable effect. The patient was most sensitive to the inhalants exclusive of the pollens. A reduction in the amount of sodium chloride in the child's diet was followed by some improvement in the asthma. The addition of a small amount of salt to the patient's reg-

ular hospital diet promptly precipitated many asthmatic attacks, and therefore all dextrose solutions for this patient were prepared with sterile distilled water. This preparation gave some relief to the child, but the response was not as satisfactory as was observed in Case One. The patient was never entirely free of symptoms or signs of asthma between attacks. A few wheezing respiratory sounds and an occasional râle could be heard posteriorly over the base of the lungs. There was some indication of infection, the child frequently showing a slight elevation of temperature, and the roentgenogram examination revealed evidence of infection in the maxillary sinuses and the bronchi.

Case Three gave the poorest response to the dextrose solution. The intravenous administration of the sugar failed to give consistent results, and when it was given orally, the patient became nauseated and vomited. The child was most sensitive to the pollens. The influence of sodium chloride in the diet was practically the same as in Case Two, there being less asthma on a low salt-free diet while a high salt diet produced more attacks. The dextrose solutions prepared with sterile distilled water gave the best results, although the patient did not clear up entirely between the asthmatic attacks. Auscultation always revealed a few wheezing respiratory sounds over the lower lung areas. A secondary infection was present. Roentgenogram study showed the picture of chronic bronchitis.

The beneficial effect of the hypertonic dextrose solutions administered intravenously in bronchial asthma has not been explained. Some investigators have felt that there is a definite flow of edema fluid from the tissue to the blood stream, and thereby the edema of the bronchial mucosa may be lessened. This statement is based of course on the assumption that there is some edema of the wall of the bronchi as well as spasm of the bronchial musculature. However, hypertonic solutions of sodium chloride have not been found effective. This is shown in Case One. Hypertonic solutions of sucrose fail to give satisfactory results, but may on the other hand, precipitate quite severe attacks of asthma, as illustrated in Cases Two and Three. Dextrose remains as the carbohydrate of choice in the treatment of asthma.

It has been assumed that dextrose (glucose) would be most effective in controlling asthmatic attacks, because the statement had been made that individuals with diabetes do not have asthma. Unfortunately, several observers have noted asthma in diabetic subjects. However, epinephrine, which still must be used to control asthmatic attacks, causes a rapid rise of the blood sugar which may even result in glycosuria.⁶ The question arises as to whether, among other things, the very fact that epinephrine increases the blood sugar is the means by which it produces its effect in allergic diseases. Experimental work⁴ has indicated that dextrose given intravenously stimulates the reticulo-endothelial system to greater activity, and since this system presumably participates in inducing immunity, it may also protect against allergic disorders. Wagner and Rackemann⁷ have shown that

the value for blood sugar and the test for glucose tolerance in allergic patients are both normal, and they conclude that whatever may be the fundamental nature of allergy, it is not concerned with the blood sugar level.

The three cases presented clearly demonstrate that dextrose is not efficacious in all cases of bronchial asthma. The hypertonic solution of dextrose has been recommended for the relief of attacks of asthma when other measures, including the use of epinephrine, have failed. The objections to the administration of dextrose are those that arise in connection with any intravenous therapy. If proper care is employed in the technic, and in obtaining a very pure form of dextrose (U. S. P.), there should be very little trouble. However, no matter how carefully the preparation is made, it will not give consistent results in the treatment of asthma. Asthmatic attacks due to ingestants may be easily controlled, but pollen asthma is very resistant. This statement has been supported by the recent experiences of several physicians.⁸ The variation in the response to the dextrose depending upon the etiology of the asthma may open a new avenue of approach to the study of the underlying mechanism in allergic disease. Of special interest in this connection is the observation that the number and severity of the asthmatic attacks in the cases which have not responded satisfactorily to the carbohydrate therapy appears to be influenced by shifts in the sodium chloride intake in the diet. This offers a new form of therapy which will be discussed in detail in future communications.

Summary

1. Three children in the same age group with histories of bronchial asthma from seven to eight years, and in whom epinephrine failed to give satisfactory results, were observed closely over a period during which they received intravenously hypertonic solutions of dextrose, sodium chloride, and sucrose. These patients were chosen to represent the study because the duration, severity, frequency, and response to epinephrine of the asthmatic attacks was practically the same in each case.

2. The asthmatic attacks due to ingestants responded favorably to the dextrose, while those due to inhalants

including the pollens were not satisfactorily controlled. Furthermore, the child without an associated infection tolerated the glucose solutions much better than the children with secondary infections. This may explain the inconsistent results which are obtained when quite a number of cases of bronchial asthma are treated more or less routinely with the same sugar solution.

3. The fact that the dextrose was administered as a hypertonic solution did not appear to aid in determining the mechanism of control of the asthma due to food allergy. Hypertonic sodium chloride solution had no influence on the asthmatic attacks.

4. The sodium chloride solution was not used in the inhalant and pollen asthma because it was considered to be dangerous, in view of the fact that preliminary investigations have shown that high salt diets tend to precipitate attacks of asthma. Hypertonic sucrose solutions, however, were tried as a substitute, but they were unsuccessful in controlling the asthmatic attacks.

5. Dextrose cannot be expected to give favorable results in all cases of asthma when such a variation occurs in response to the intravenous administration, as has been observed in the three children with bronchial asthma reported in this communication. However, further use of it, in spite of the fact that no definite conclusions can be drawn from present observations, may eventually lead to a better understanding of the fundamental nature of allergy.

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Fractures of the Spine*

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MUCH has been written on fractures of the spine in the past, and many forms of treatment have been advocated. These vary from doing practically nothing other than putting the patient on a hard bed, to radical methods of surgical fusion of the affected region of the spine. It is hoped that we will be able to follow some course which leans decidedly in the conservative direction, as it seems to be the way to better results and fewer regrets and failures.

These fractures are assuming a greater importance recently than they have in the past, as they are being found more often in young people, and the female is becoming a victim with greater frequency. The violent winter sports such as skiing, tobogganing on rough slopes, automobiles and airplanes are added to industrial accidents as the causes of these injuries, and probably explain the increased incidence of the fractures in women.

It is not our intention to cover the entire subject of vertebral fractures in this short paper. For this reason, no mention will be made of cervical spine injuries, and the various complications which may arise in fractures in any region of the spine. Fractures involving the dorso-lumbar region of the spine are the most common, and will therefore be the subject of this paper.

The most freely movable regions of the spine are more susceptible to injury, and to fracture in particular. These are usually points marking transitional changes in the spine from a functional or anatomical aspect. The most important region where such change takes place is the dorso-lumbar junction, where a comparatively inactive dorsal spine supported by the rib cage and strong vertebral articular facets suddenly changes over to the short, freely movable lumbar spine depending particularly on muscles for support, and whose articular facets are so arranged that motion in flexion and extension is extremely free.

The first lumbar vertebra suffers most frequently in falls on the feet or buttocks, or when heavy weights are suddenly dropped on the shoulders or back, forcing the spine into flexion or extension. Fractures of the twelfth thoracic, second, third, fourth and fifth lumbar vertebrae are all fairly common; but their combined numbers are not quite double the frequency of fracture of the first lumbar vertebra. Many authors state that fully 40 per cent of all fractures of the spine occur at the dorso-lumbar junction. The type of fracture produced is dependent to a large extent upon the nature of the trauma, and whether the violence is applied to the vertebral column in a direct or indirect manner. As an example, fractures of those portions of the vertebrae which enter

into the formation of the neural arches are more frequently produced by direct blows on the back, or by bullet and knife wounds. A weight dropped suddenly on the shoulders with the spine flexed as in stooping, may produce articular facet fractures by indirect means. Indirect violence is applied to the vertebral bodies by the forced sudden movement of the spine beyond its normal range. These flexion movements may be forward, backward, to the sides, or in rotary direction, all of which lead to compression of certain portions of the vertebral bodies. In addition to this, we have the vertical compression of the entire spine from sudden jars, as in falling from a height and landing on the feet with the knees fully extended. It is possible, in many cases, upon studying the radiograph to determine the type of injury, or at least, the direction of application of force upon the affected vertebra. Forward flexion of the spine with compression of the body of the vertebra is the most important factor in the production of fractures. Forward or lateral flexion determines the direction of displacement of the fragments.

Vertical compression alone may produce the most complete collapse of the vertebral body, which becomes widened in all directions. The degree to which the fragments can spread is determined anteriorly and posteriorly by the spinal ligaments, but fragments may be pushed back into the neural canal so as to press upon the spinal cord and produce symptoms of sensory and motor nerve impairment at the segmental level of the lesion.

If the injury has caused compression of the body by forcing the spine into flexion, the lateral radiograph demonstrates the break-down of the anterior portion of the body usually with the extrusion forward of a triangular segment. The vertical depth of the posterior margin of the body is usually unchanged, and the posterior spinal ligament is intact, thus protecting the spinal cord from injury.

Lateral flexion leads to compression of the antero-lateral portion of the body and is accompanied by a modified rotary movement of the fragments. The antero-posterior radiograph demonstrates narrowing of one side of the body as compared with the other, an extreme degree of comminution and the displacement of the fragments. Injuries to the spinal cord are reported as very common in this type of fracture.

It seems to be futile to try to type fractures of the vertebrae by a consideration of the causative forces, as so many authors have done. If one speaks of the entire group as indirect flexion-compression fractures of the vertebral bodies, the mechanics can be well visualized. This leaves the fractures of the transverse spinal processes, neural arches, and articular facets to be placed in the group caused by direct injury or muscular violence,

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Not all injuries to the back are severe enough to cause fracture. Concussion of the spine is possible, and some writers have suggested the possibility of impaction of the trabeculae of the spongy bone, which may lead to the destruction of the sinusoids to be followed later by a rarefying osteitis or aseptic necrosis which allows the vertebral body to collapse. Frequently, the symptoms and general appearance of a spinal fracture with the complications attributed to nerve-root pressure are found in this condition, which is referred to as Kümmel's Disease.

Diagnosis of fracture is not in most cases difficult. If every complaint of severe backache or pain coming on immediately after a fall or violent accident were analyzed with the question in mind of ruling out a fracture, many of the unrecognized fractures would be afforded early treatment and relief from disability. Apart from the history of an injury, a good lateral and stereoscopic antero-posterior radiograph of the suspected area in the spine is of the very greatest importance. A search is made for isolated fractures of the articular facets or the transverse processes, and, if there is a body fractured, the amount of damage done to the vertebra above and below the lesion is appraised. Multiple fractures do occur and these should be recognized if the patient is to receive maximum benefit from treatment and the doctor saved subsequent embarrassment.

Radiographic examination must be complete, and in order to insure accurate information upon which to base a diagnosis and prognosis, the details of bone structure and intervertebral articulations must be well shown. It has been our custom always to obtain stereoscopic antero-posterior and lateral views of the spine at the suspected site of the injury. Broken articular facets, if not recognized, may make the reduction of the vertebral body fracture more difficult and dangerous and if not treated may result in chronic backache and prolonged disability. The need for surgical interference to remove a fragment which is pressing upon the spinal cord may be revealed in the radiograph and treatment instituted immediately.

A careful neurological examination made before radiographs are taken sometimes gives an indication of the level of the involved vertebra. Disturbances of sensation or muscle weakness and nerve-root pain aid materially in determining the segmental level of the lesion in the spine. Paralysis and involvement of sensation are much more common with lesions involving the cervical region of the spine than with those in the dorso-lumbar.

Pott's disease may simulate fracture of the spine in some cases, but when the destruction of the intervertebral disks and the presence of an abscess are noted in the antero-posterior or lateral radiograph, there should be no difficulty in recognizing the condition.

Treatment

First Aid: The early treatment of back injuries suspected of being spine fractures is of great importance, and must be stressed at every opportunity. Proper preliminary care will, in many cases, determine whether or

not complications will arise to increase the difficulty in treating the patient, and make complete recovery doubtful or impossible. People who are apt to see these cases should be taught to leave the victim prone at the site of the accident, and not sit him up or try to have him walk to some place which is presumed to be more comfortable. Measures should be instituted to combat shock, such as keeping the injured one warm by using such covers as are available, making him as comfortable as possible, and giving narcotics, if there are any at hand. Transportation to a hospital or dressing station is safe if the patient is carefully rolled onto his abdomen and carried face down on a stretcher, blanket or hammock. If there has been a crushing fracture of the vertebral body, this precaution prevents flexion of the spine which might lead to additional displacement of fragments with serious consequences. Certainly it is impossible for the deformity to increase in this position.

Permanent treatment may be divided into conservative or non-operative and radical or operative measures. Firstly let us consider:

Conservative Treatment

Although early diagnosis is of great importance, our first step must be to get the patient into as good condition, physiologically speaking, as is possible. Shock may vary from a mild, dazed condition to the extreme, dangerous type with depression of all vital centers. Opiates in sufficient doses should be used to control the pain, and the patient kept quiet and warm on a firm flat bed. It has been our custom to use boards between the mattress and springs to eliminate all sagging in the bed, and a pad may be placed across the back at the site of the lesion so as to produce some hyperextension. Abdominal distension and paresis of the bladder and bowel may persist for a few days as an indication of mild injury to the spinal cord. A brief period of quiet rest will in most cases take care of these disturbances, or pitressin in 0.5 to 1.0 cc. doses may be used intramuscularly in patients whose blood pressure is not elevated, to assist in the elimination of the flatulence.

The intravenous administration of saline, glucose solution or blood from a suitable donor may be necessary to bring the blood pressure up to its normal level. A more detailed account of shock treatment need not be given as the principles are well-known to all of you.

It is advisable to proceed as rapidly as possible with steps to localize accurately the site and nature of the lesion, as early treatment assists materially in improving the ultimate outcome. Manipulation delayed more than two or three weeks will in many cases lead to failure of reduction and a poor end-result.

A careful physical examination will reveal the presence of irritation or injury of the spinal cord and the level at which it exists. Changes in the tendon reflexes, areas of anesthesia or hypoesthesia, variations in muscle tone, partial paralysis, bladder and bowel retention are some of the signs which may be uncovered, and which will be of great assistance in determining the course to be followed.

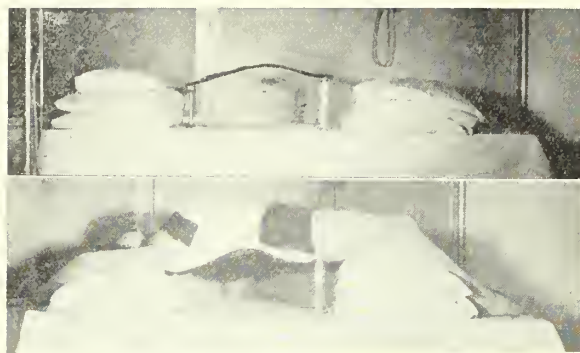


Fig. 1. Illustrates the use of the Goldthwait irons, maintaining the spine in hyperextension for the application of a plaster-of-Paris body jacket. Pillow or pads are used at the upper and lower ends of the iron.

The best time for reduction of the fracture is during the first week after the accident, providing the physical condition of the patient is satisfactory. Many methods have been devised and the exponents of each method report and undoubtedly do get good results. The method described by Davis and others has been very satisfactory in our hands. With the patient under anesthesia face down, the chest and upper extremities are supported on a table or cart. A block and tackle attached to a hook in the ceiling or door frame and the other end to a bandage about the patient's ankles, is used to pull the legs and lower portion of the trunk up into hyperextension. Gentle but firm pressure on the back at the site of the fracture assures the surgeon of obtaining maximum hyperextension at this point. The normal vertical diameter of the bone is restored by the tension on the anterior spinal ligament pulling apart the upper and lower plates of the vertebral body. An undershirt slipped on over the patient's head before the plaster is applied prevents much of the irritation and itching of the skin during the time the jacket is worn. With the patient in this position a carefully padded plaster-of-Paris jacket is applied, reaching from the clavicles above to the groin below. It should be moulded over the iliac crests and the greater trochanters of the femurs, and kept as high as possible in the axillae in order to prevent it from moving up or down on the patient's body. An opening or window is cut in the front of the plaster over the upper portion of the abdomen, to allow for expansion due to respiration and eating.

Among the popular methods of reduction, one can mention that of O'Donoghue, who places the patient on his back with the upper and lower extremities supported on separate tables or carts. With a well-padded automobile jack at the fracture site, the spine is lifted into marked hyperextension and a plaster-of-Paris jacket applied while the correction is held. The pain after reduction may be severe and hard to control. This fact alone has led to unpopularity for the method.

Dunlop places the patient on his back on a folded sheet or binder which crosses the spine at the level of the fracture. Assistants make traction on the upper and

lower extremities while the operators each holding an end of the folded sheet quickly lift the patient off the table. By a sharp upward jerk he is thrown up three to four inches, and caught on the tightly stretched binder. The hyperextension is extreme and rapidly produced, and a plaster jacket is applied with the patient on the Goldthwait irons or canvas sling. (Figure 1.)

Rogers places his patient on a flexible frame, which is adjusted at frequent intervals to obtain gradual complete reduction without the use of an anesthetic. The entire treatment may be completed on this frame, or a plaster dressing may be applied later. The Gatch bed may serve as a substitute for an adjustable frame. The patient is reversed on the bed so that the portion which ordinarily flexes the knees pushes the back up into hyperextension, gradually reducing the fracture.

Another method calls for placing the patient face down on two tables, the one supporting the head and upper extremities, the other supporting the lower extremities. The former support is considerably higher than the latter. No anesthesia is used and the portion of the trunk, which is not supported, gradually sags into hyperextension, in which position the plaster jacket is applied. Excellent reduction of the fracture is obtained, and the method is probably the simplest one of all, in that it can be carried out without any special equipment in any place, and without anesthesia. (Figure 2.)

In reviewing the various methods, one is struck with the fact that the underlying principle is the same. Using the intervertebral articulations or the nucleus pulposus when it is intact, as the fulcrum, hyperextension is produced so as to put the anterior and posterior spinal ligaments under tension, pulling the upper and lower plates of the crushed vertebra apart and moulding fragments into their proper position. It is evident that broken articular processes, if unrecognized, could add to the danger of manipulation of these fractures.

An X-ray of the spine should be taken following the manipulation of the fracture and application of fixation.

Most surgeons now prefer plaster-of-Paris jackets as a means of holding the spine in good position after reduction. Some still recommend the use of plaster beds or plaster shells which can be removed for the care of the patient's skin.

A plaster jacket must be worn by the patient for a short time before it becomes comfortable. Many changes in methods of breathing and sleeping need to be made. Immediately following its application, there is likely to be a period of discomfort due to flatulence, difficulty in breathing and in eating due to the constriction of the plaster. Nausea and vomiting are often experienced. Stopping all fluid and solid intake by mouth for 24 hours and the administration of six to nine grains pentobarbital sodium (nembutal) by rectum will usually take care of these symptoms. Intramuscular injection of pitressin, enemata, and the rectal tube rapidly relieve the



Fig. 2. Shows the patient supported between two tables with the spine sagging into hyperextension assisted by firm pressure applied by the operator. Felt pads are applied over all bony prominences and a well moulded plaster-of-Paris jacket is put on.

flatulence. Encouragement helps to carry the patient along for the two or three uncomfortable days. There is little difficulty experienced by the end of the first week. The plaster has a tendency to slide up on the body and bind in the axilla, and one must take care not to trim it away too much at these points. The more plaster cut away from under the arms, the more the jacket will slide up.

There follows a period of recumbency of six to eight weeks on a firm bed with the plaster jacket supported on sand-bags or pillows, during which time the patient exercises leg, arm and back muscles every day. This improves the general circulation, keeps up the muscle tone, hastens the formation of callous, and when the time comes for getting up, there is sufficient strength in the muscles to keep the spine supported and to make locomotion easy. Some men allow the patient to be ambulatory in the plaster jacket after a month in bed, or when the fracture is of a mild degree, they may be allowed up after two or three days. Bearing in mind that the weight of the body in the upright position with the spine in hyperextension is borne well back by the articular processes, one sees that there is very little pressure on the vertebral bodies themselves. If the jacket is closely moulded, and holds the spine in exaggerated hyperextension, early locomotion is comparatively safe, although somewhat awkward. The wisest course to follow

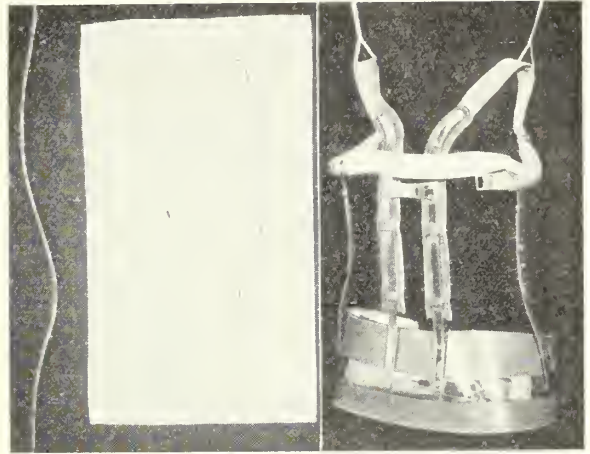


Fig. 3. Illustrates the use of the flexible tin or lead tape, which has been laid on the spine with the patient in the supine position. The contour of the back is obtained in this manner and traced on paper. In a similar way the contour of the sides of the body in the mid-axillary line is obtained for the proper fitting of the crutches. Circumferences are measured every two inches at the lower portion of the back to insure the proper fitting of the pelvic girdle. The spinal brace which is most frequently used is the Taylor type with or without the crutches.

is to insist on six to eight weeks of lying prone in bed, if there is any doubt as to the fit of the support.

At the end of the period in bed, the plaster jacket is split along each side into a front and back half, which can be removed carefully for a radiograph to show the state of healing of the fracture. Tenderness on deep percussion over the spinous processes usually means that the callous is not sufficiently strong to warrant removal of the fixation. An additional two to three weeks in the plaster halves bound on with tape or straps is sufficient, and during this time a spinal brace should be prepared from measurements, contour tracing or plaster model of the back. (Figure 3.) This insures a proper fit of the brace and efficient support.

In most cases it is essential that the spine be supported by this leather and steel brace for at least nine months following removal of the plaster jacket, and daily exercises of the muscles with the patient in the prone position should be continued. The brace is used only when the patient is ambulatory, while a firm bed, as previously mentioned, is used at other times.

There are some surgeons who advocate early operation in recent fractures to produce ankylosis quickly, shorten the length of time the patient is incapacitated, and decrease the amount of disability. Conservative treatment as outlined above is adhered to by the majority, and statistics show that there is no saving in time nor added benefit to the patient resulting from early operation. The risk of an operation of such magnitude and the extensive fusion which is necessary to immobilize the fracture, are excellent arguments against this radical form of treatment. Old fractures which have not healed properly by virtue of insufficient or improper treatment may be accompanied by disabling symptoms. In these cases, very definite improvement can be obtained by one of the fusion operations such as described

by Hibbs, Albee, and others. After an operation of this type, it is necessary to immobilize the back in a plaster jacket for about 12 weeks, following which a spinal brace is worn for an additional six to nine months.

There might seem to be more definite indications for surgical interference with fractures of the spine accompanied by neurological complications; but this is not always the case. The inexperience of most surgeons in this type of work, the lack of facilities for handling cases of this type, and the grave risks encountered, may be balanced against the knowledge that not many of these neurological complications are actually materially benefited by operation in the very best hands, and when the cord is not too severely damaged, much improvement may be expected under conservative management. The trend in treatment is toward the conservative form as one becomes more experienced. However, when symptoms of increasing cord pressure arise, or when bony spicules or foreign bodies (such as bullets) are demonstrated by the X-ray to be in the spinal canal and impinging upon the spinal cord, one has definite indications for early operation, so that the damage may be minimized. After operation, the patient is immobilized on a frame, hard bed, or in plaster as has been outlined above. Extremities which are paralyzed must be supported in metal or moulded plaster splints, and if sensory changes have occurred, the supports are carefully padded to prevent the development of decubitus ulcers. A cradle or frame is placed over the extremities to relieve

them of the weight of the bed covers. If an electric light is placed in the cradle under the covers, sufficient warmth is produced to assist in supporting the circulation.

The inlying catheter is preferred to repeated catheterization in those cases having involvement of the sphincters. There is much less danger of contamination resulting in cystitis and pyelitis from the former method, according to some authorities. In the experience of most surgeons, early infection of the bladder follows either method.

Summary

1. The types of fractures of the vertebrae have been outlined, and the mechanics of their production indicated.
2. Intelligent "first aid" will minimize the seriousness of the injury, and tend to prevent the development of complications.
3. Variations of the principle of hyperextension to reduce the fracture followed by immobilization until healing is obtained, are mentioned.
4. Conservative handling of fractures of the spine will be productive of better results in a greater percentage of cases than will the radical forms of treatment.
5. Surgical intervention must be reserved for cases showing evidence of increasing cord pressure, or the presence of foreign bodies or bone fragments impinging upon the spinal cord.

Homonymous Hemianopsia*

With and Without Sparing of the Macula in Lesions of the Visual Cortex

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THE VISUAL CORTEX in man is located on the medial aspect of the occipital lobe along the posterior calcarine fissure. In the main, the pathways of the visual fibers from the calcarine cortex to the primary optic centers and thence to the retina, have been well-established for a number of years.

However, it was not until 1916 that our knowledge of retinal representation in the visual cortex was placed upon a scientific basis by Holmes and Lister.⁵ These investigators reported their observations on a large number of cases of gunshot wounds of the occipital region, and concluded that there is a definite point-to-point representation of the peripheral as well as the macular portions of the retina upon the visual cortex. Their observations for the most part confirmed the previously known fact that the whole of the visual area of one hemisphere is connected with the corresponding lateral half of both retinae.

Their findings may be summarized as follows:

1. Macular representation is located at the occipital poles.
2. The upper lip of the calcarine fissure represents the upper half of the retina, while the lower lip of the calcarine fissure represents the lower half of the retina.
3. Lesions of the apex of the cuneus or the most anterior portions of the calcarine cortex were found to be associated with defects in the peripheral visual field.
4. The intermediate area of the visual cortex was found to be connected with the intermediate portion of the retina.
5. In unilateral lesions of the visual cortex where an homonymous hemianopsia exists, that this always extends right up to the fixation point.

A common finding in vascular lesions, such as embolus or thrombosis of the posterior cerebral artery, is an homonymous hemianopsia with sparing of the macula.

* Presented before the Minnesota Academy of Ophthalmology & Otolaryngology, May 5, 1937.

† Clinical assistant professor of ophthalmology, University of Minnesota.

Case I.

Name Mrs. M. P.

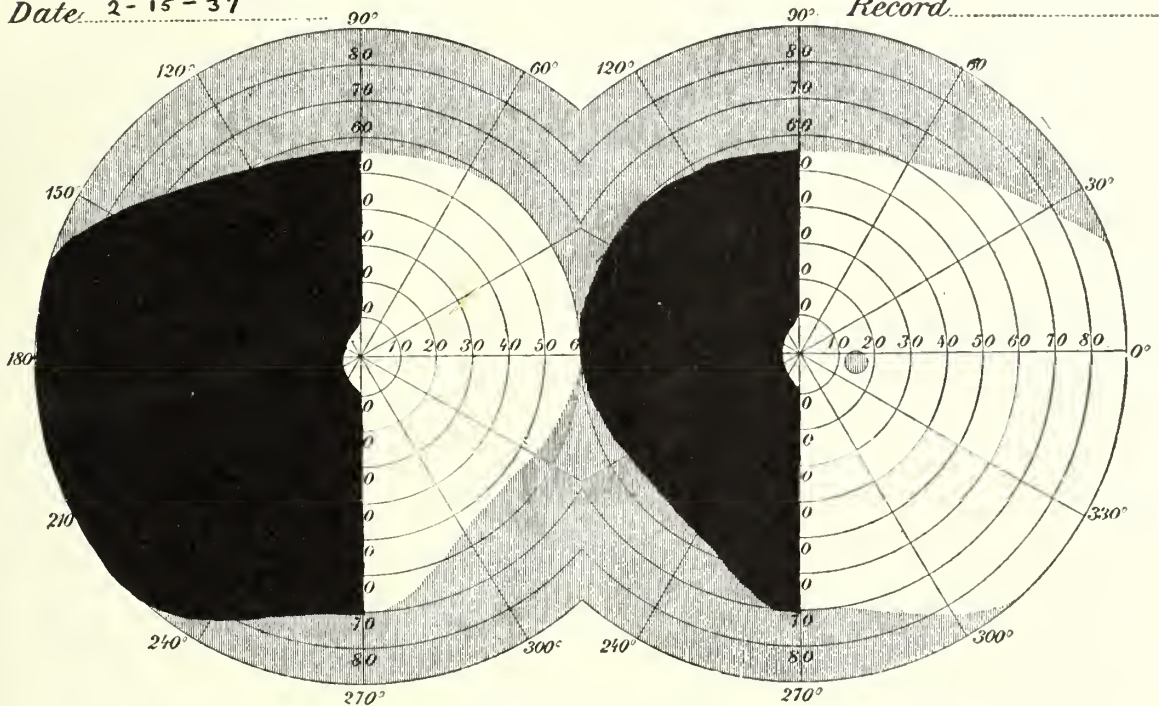
L. E.

Date 2-15-37

R. E.

No.

Record



Case 1. Mrs. M. P. Left homonymous hemianopsia, with sparing of the macula, from abscess involving the visual cortex right occipital lobe.

The afore-mentioned investigators suggest that this sparing of the macula is due to anastomosis between the middle and posterior cerebral arteries, thus contradicting the view that in such cases each macula has a bicortical representation. However, if as it has been thought, the arterial supply of the brain cortex consists of end arteries only, then such an explanation would not hold. However, Fay⁴ in 1925 made stereoscopic studies of X-rays of brains which he had injected with mercury, and found well-defined anastomotic trunks to exist between the anterior, middle, and posterior cerebral arteries.

It is not only in vascular lesions of the occipital cortex that the macula is spared, but a number of cases of occipital lobe tumors have also been reported by Allan¹ in 1930 and Horrax and Putnam⁷ in 1932 where homonymous hemianopsia occurred, and the macula spared in some cases, while in others the field defect approached the fixation point.

Penfield¹¹ and his co-workers, in 1935, reported five operated cases of occipital lobe lesions with sparing of the macula in two of these cases. From these observations, he is firmly of the opinion that both maculae are represented in each hemisphere. He believes that macular fibers pass from the visual cortex of each occipital lobe to both external geniculate bodies, the decussating fibers passing over to the contralateral side by way of the splenium of the corpus callosum.

On the other hand, Poljak's⁸ experiments on monkeys in 1932, and Spence's and Fulton's¹² experiments in 1936 fail to demonstrate any crossing of the visual fibers from the striate cortex to the contralateral external geniculate body. Poljak believes that sparing of the macula takes place only where the cortex of the corresponding portion of the macula is intact.

The most potent argument against the existence of a decussating bundle of macular fibers between the macular cortex and the external geniculate body is the failure to find such a tract experimentally. If these decussating fibers do exist, it would imply that the fibers from the various parts of each macula would be distributed at random to both visual cortical areas. The destruction of one of these areas would not result in a partial macular scotoma, but in a diminution of the number of visual elements throughout each macula and a consequent loss of visual acuity. However, such loss of visual acuity does not take place as the cases herein reported illustrate.

Furthermore, in lesions which completely interrupt one optic tract, there is no sparing of the macula, but an homonymous hemianopsia to the fixation point results. This proves that the temporal half of the macula does not cross at the chiasm. On the other hand, if it is supposed that the temporal halves of the macular fibers cross to the opposite visual cortex behind the primary optic centers it would be impossible to explain the

Name Mrs. E. M. B.

Case 2.

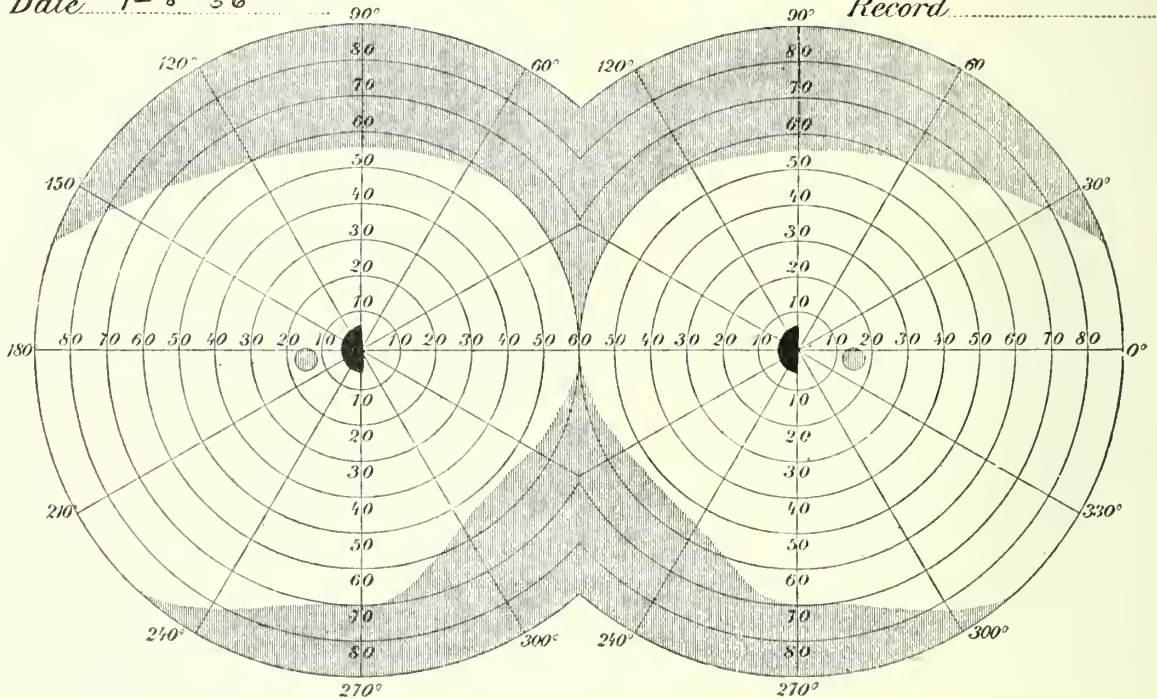
No.

Date 7-8-36

L. E.

R. E.

Record



Case 2. Mrs. E. M. B. Left homonymous macular scotoma, remainder of visual fields normal. Scotoma bisects the maculae.

homonymous hemianopsia without macular sparing resulting from single lesions of the visual cortex.

Case 1. Mrs. M. P., age 32, developed a chronic empyema following an attack of pneumonia in January, 1931, for which she was treated at the University Hospital. On February 14, 1937, she was re-admitted to University Hospital with complaints of persistent frontal head-aches for one week. On the day of admission she was unable to see objects on her left side. Vision in each eye was 20/15. Field studies revealed a left homonymous hemianopsia with sparing of the macula. A diagnosis was made of embolism of the right posterior cerebral artery with a lesion in the occipital lobe. Before the patient expired on February 25, 1937, the lesion of the occipital lobe was considered to be an embolic abscess of short duration.

Pathological examination of the brain revealed a large multicocular abscess of recent origin in the right occipital lobe extending almost to the occipital pole.

Case 2. Mrs. E. M. B., age 42. This patient was admitted to University Hospital on June 16, 1936, with a diagnosis of osteoma of the right occipital region just to the right of the midline. This was removed on June 17, 1936. Shortly after her operation the patient complained of difficulty with her eyes. Examination revealed an absolute left homonymous central scotoma, the remainder of the fields being normal, and vision in each

eye was 20/15. On July 15, 1936, it was noted that the sharply outlined hemianopic defects were of the same extent, but the scotoma were much less dense. The patient was able to distinguish one mm. white and colored targets in the area of previous absolute scotoma, but stated that they were blurred and hazy. On November 23, 1936, field examination revealed a central relative scotoma for red, the red target appearing pink.

These two cases of single occipital lobe lesions are classic illustrations of point-to-point retinal representation in the visual cortex. In one, the lesion involved the entire occipital lobe with the exception of the apex, thus sparing the macula; while in the other, the lesion involved only the apex or macular region of the visual cortex, resulting in an homonymous macular scotoma to the fixation point.

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Some Facts and Comments on Physical Therapy

A Review of the Literature

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Definition and Scope of Physical Therapy

PHYSICAL THERAPY (or physiotherapy) is a term employed to define the treatment of disease by various non-medicinal means. It is the art of applying kinetic energy to a living organism for the purpose of preventing, ameliorating, curing or modifying abnormal structure and function.

Natural remedies for the relief of disease and injury have been employed empirically since the dawn of mankind. Hippocrates, about 430 B. C., in discussing the treatment of a dislocated shoulder, following reduction, said: "And it is necessary to rub the shoulder gently and smoothly. The physician must be experienced in many things but assuredly also in rubbing; for things that have the same name have not the same effects. For rubbing can bind a joint which is too loose and loosen a joint that is too hard."

Physical therapy is not a new system of recognizing and treating diseases, but comprises the intelligent application of simple, age-old healing forces as well as some of the most recent advances of technical science. Physical measures, while chiefly adjuncts to other indicated medical and surgical care, have proven of definite and at times of specific value in many conditions. They can be employed for combating the principal pathological changes or for alleviating one or more of the bothersome symptoms: pain, spasm or other functional disorders. They can be directly applied to the site of the pathological changes or used for general constitutional effects. Whether a general practitioner or specialist, every physician should be able to use some physical measures in his daily work.

Massage, passive or active exercise, muscle-training exercises and the application of heat, represent practically the only physical therapy needed in the great majority of medical or surgical conditions. There are certain pathologic conditions, however, which require the use of more elaborate forms of physical therapy.

Many physicians, unfamiliar with the agents used for physical therapy, have the idea that when this term is used, an "electrical apparatus" of some type is referred

to. Under this general term, the following physical measures are included—they have been found both by long clinical experience and by laboratory research to have certain therapeutic value when appropriately prescribed:

1. Electrotherapy.
 - a. Galvanic.
 - b. Faradic.
 - c. Sinusoidal.
 - d. Static.
 - e. Diathermy:
 1. Conventional. . .
 2. Short-wave.
2. Phototherapy.
 - a. Light and heat.
 - b. Infra-red radiations.
 - c. Ultra-violet rays (of air- and water-cooled apparatus.)
3. Hydrotherapy.
 - a. Whirlpool bath.
 - b. Tub bath.
 - c. Sitz bath.
 - d. Contrast bath.
 - e. Showers (needle douche, etc.)
4. Mechanotherapy.
 - a. Massage.
 - b. Vibration.
 - c. Corrective exercises.

Our space permits only a brief discussion of a few of the more commonly used modalities.

Medical Diathermy

Medical diathermy is the production of heat in the body tissues for therapeutic purposes by high frequency currents. Here the temperature of all or part of the body is raised above the normal, but not beyond that which the tissues or body can stand and survive. The patient is in shunt with the d'Arsonval solenoid of the high frequency circuit, and is traversed by the electrical current having damped oscillations of high potential and high frequency. The heating effect takes place from

the area of the skin in contact with electrodes inward, and is due to (ohmic) resistance of the tissues of the passage of the current, as well as (in part) to the absorption of the electro-magnetic field accompanying the current through the conducting paths of the body.

According to Coulter, well-established evidence indicates that the local application of heat is effective as an adjunct in the treatment of certain traumatic or inflammatory changes in the bones, joints, bursae, muscles, ligaments and tendons. Both long and short wave diathermy are effective methods of applying heat, and can be used to advantage for many of these conditions. There is no available evidence that medical diathermy has any effect other than that due to the heat produced.

In arthritis, the use of diathermy is sometimes observed to give benefit from a clinical point of view, but it is contraindicated and has been disappointing in many chronic cases. Pemberton and Osgood state: "In many of the superficial joints, however, real danger of harm lurks in any but the most skillful administration of diathermy. The articular cartilage of joints is devoid of both sensation and circulation, possessing neither protective nerves nor cooling blood vessels. Moreover, articular cartilage has no power of regeneration, and, if injured, has little power of repair."

In acute epididymitis, the elevation of temperature by diathermy is distinctly beneficial for the relief of pain and hastens the subsidence of the infection. For treating gonorrheal urethritis, the use of conventional diathermy has been discounted in recent text-books of urology and is not advocated as a treatment for acute urethritis. *Gonococcus* in culture will survive thirty minutes at a temperature of 113° F., and even with the improved short-wave machines there is little prospect of attaining the temperature with the local treatment in all parts of the male urethra without over-heating certain parts.

Medical diathermy has been recommended in the treatment of nephritis, but no recent literature substantiates the earlier claims of benefit. Harrison believes that diathermy is the treatment of choice in the cases of acute prostatitis occurring either as a complication of an acute urethritis, or in that smaller group of cases in which the infection is hematogenous from disease elsewhere, such as influenza.

Diathermy is used in fractures to increase heat in the deep parts. By increasing the circulation, it is expected that waste products would be carried away more rapidly and more bone salts brought to the part. As a matter of fact, we have no conclusive evidence that the amount of calcium or phosphorus in the diet or the blood has the slightest effect on the rate of healing of a fracture. Probably the bone salts used in repair are obtained locally from the bone, which degenerates at each end of the fracture as a result of injury.

Short-Wave Diathermy

Short-wave and ultra-short-wave diathermy is a newer method of heating in which the body or a part of it is

placed in a "condenser field" consisting of metal plates separated from the skin by an insulating layer of soft rubber, felt, or glass. These electrodes are charged by oscillations at radio frequency and, measured by wave meters, these oscillations correspond with wave lengths from thirty to three meters; a differentiation is made between short-wave diathermy with wave lengths from thirty to twelve meters, and ultra-short-wave diathermy with wave lengths below twelve meters.

"The claim for the advantage of short wave diathermy over ordinary diathermy is that," states Kovács, "it is simpler and safer and gives more effective heat penetration; for ultra-short-wave 'selective' heating and specific effects on acute inflammatory processes in the skin and body cavities are claimed. Of all these claims, that of simplicity appears to be the most acceptable, but even this cannot go unchallenged because there is no dependable meter reading as guide of dosage and regulation the latter being crude, based entirely on skin sensation. Burns under electrodes and conflagration due to over-heating of rubber cables have been reported. Proof has been brought that efficient short-wave apparatus brings about more heat production in the depth than ordinary diathermy, but there is no controlled clinical evidence that such heating produces better results; neither has it been disproved as yet that excess heating in the depth may not have undesirable effects."

The indications for short wave diathermy are essentially the indications for conventional diathermy.

Fever Therapy

A recent development in the use of heat is the artificial induction of fever. When heating is applied at a sufficient intensity to a large part of the body or if heat loss from the body is prevented, a rise from body temperature is brought about and general physiological changes arise. There is an increase in the circulatory rate, rise in blood volume and oxygen consumption, increased metabolism and changes in the urine, blood and sweat to the alkaline side.

The presumable clinical benefits of fever therapy have been summed up recently by Hensch, Slocumb, and Popp of the Mayo Clinic as follows: (1) a direct bacteriolytic or bacteriostatic effect due to the influence of heat itself on bacteria, without necessarily implying formation of immune bodies; (2) an indirect bacteriolytic or bacteriostatic effect resulting from increasing formation or mobilization of immune bodies; (3) a local effect from vasodilatation, providing an augmented blood supply to inflamed tissues, and (4) a general effect from the heightened metabolism incident to fever.

Fever therapy of neurosyphilis and possibly of early syphilis has opened up in recent years an important new field. In general paresis, tabes and taboparesis and central nervous system syphilis, results by physical fever methods similar or better than those with malarial inoculations were reported. Gonorrheal infection, both acute and chronic, has proved to be perhaps the most successful object of the newer methods of thermal therapy,

especially since the advent of hyperpyrexia. Bierman and Horowitz have shown that the elevation of systemic temperatures to 105° to 106°, combined with raising the pelvic temperature to 110° to 112°, gives brilliant results in gonorrheal infections of the pelvis.

Iontophoresis

Iontophoresis, or the driving of medicinal ions into the tissues by the polarity action of the current, has come, according to Kovács, to the fore again in the past few years. As is well understood, the positive pole of a galvanic current repels ions with a positive charge—such as those of the heavy metals, zinc and copper—while the negative pole of the current repels ions with a negative charge such as chlorine. When medicinal solutions containing these heavy metals are applied by ionization, these metals on account of their great affinity to the tissue proteins form an insoluble precipitate with them. As a result there is devitalization of tissue—a widespread form of chemical cauterization—in proportion to the strength and length of current flow. The thin or heavy slough leads to a slow separation of detritus and formation of new granulation tissue. Such treatment has proven effective in chronic endocervicitis, in chronic middle ear disease, *etc.* There may be, by reflex or by direct destruction of nerve endings, some sedation of sensory nerve irritation originating in the mucosa. This may serve as a physiological basis of the explanation of a treatment recently recommended for allergic conditions by a form of zinc ionization of the nasal mucosa.

The rationale of introducing vasodilating drugs by the polarity effects of the galvanic current is based on research work pointing to a close connection between disturbed peripheral circulation and arthritic condition. Histamine and choline compounds, notably mecholyl, are the drugs with which considerable laboratory work as well as clinical work in the treatment of rheumatoid conditions has been done in recent years.

The Ultra-Violet Ray

The treatment of rickets, infantile tetany and osteomalacia by means of the ultra-violet rays rests upon

abundant biochemical studies. It is generally agreed that the favorable effects are due to photochemical reactions resulting from absorption of the rays and the prevailing opinion at present favors the view that the sterol in the skin is rendered photo-active by radiation. It has been shown that the irradiated animal or human skin is anti-rachitic and that this action is independent of the nervous or circulatory systems. The use of the ultra-violet or of helio-therapy in the treatment of extrapulmonary forms of tuberculosis, of erysipelas, and other superficial infections, rests chiefly upon empirical basis.

Conclusion

Progress is certainly being made in every department of physical therapy, and it is gradually emerging into a scientific branch of the healing art. When the indications and limitations of physical therapy are thoroughly understood, there can be no question but that it is a great advance in dealing with disease. For one who has been interested in the practice of physical therapy for many years, the gradual evolution of this art is not only interesting, but also a source of great pride and satisfaction.

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1938---And Its Opportunities

THE JOURNAL-LANCET extends the heartiest wishes for the New Year to its readers. For the entire medical profession the coming year promises the greatest opportunities for service to mankind. Medical advances in all spheres make these opportunities the most significant that any generation of physicians has ever enjoyed. The stress of world and national affairs is immediately reflected in this profession. Like the past year, the next holds momentous decisions for each as a practitioner, and for all as a profession.

THE JOURNAL-LANCET will continue to widen its scope as an indispensable journal for physicians. *Time* has said that publication is the life-blood of science. To supply this, the JOURNAL-LANCET will publish the most carefully selected, practical and timely articles in its history, including special numbers on such subjects as syphilis and pediatrics, the coming year.

The future, then, holds promise of a truly worth while New Year for those who have the work to do and the ability and willingness to do it.

J. A. MYERS, M.D.,

Chairman, Board of Editors

TEMPEST IN A TEAPOT

The brewing was started by the "Committee of Physicians," apparently an homogeneous group, representing officials of medical schools, the professors of medicine, universities, hospitals and governmental health agencies. Their assumed ability to speak for the medical profession must have been enterogenous. The self-appointed Committee began issuing statements for the press and circularizing physicians for approval of principles and proposals. News stories of their activities occurred in the press throughout the country. Immediately the news reporters and editors sensed a "rebellion within organized medicine" and a controversy with possibilities of supplying news print for some time to come. Here was a situation analogous to the C. I. O. rebellion from the authority of the A. F. of L.

The whole affair had its conception innocuous enough, but by the time the press had headlined it for the Committee and the American Medical Association had editorialized it, the whirlwind of opinion had reached the proportions of a hurricane. Now, through the agencies of both the Committee and the American Medical Association and its subdivisions, the affair has become the topic of conversation wherever medical men gather.

A close examination of the principles and proposals fails to reveal in any one principle or proposal, or all combined, sufficient difference of opinion to cause contention of the magnitude that has developed. The signers are entitled in this "land of the free" to the expression of their opinions. Few physicians will recognize that in these times, changing economic conditions require commensurate changes in medical economics. Neither the proposals of the Committee, nor those of the American Medical Association, can be considered as answering entirely the existing problems of medical care.

The importance of the controversy lies not in the differences of opinion, but in the fact that "strife" has been injected into organized medicine and that is all-important. All efforts should be expended to remove this "strife" before it becomes very serious.

Human nature changes little from generation to generation, nor does it vary appreciably in localities. A good dinner is one of the most potent catalytic agencies for the establishment of good feeling and good will amongst men. It is highly probable that an invitation from the trustees of the American Medical Association to the Committee of Physicians would quickly accomplish the desired results, or at least place the controversy in a position to be rationally settled at the San Francisco meeting, in the House of Delegates.

It is evident that the Committee of Physicians are, by the positions they occupy, not competent to speak for the great mass of practitioners of medicine; they are, however, very competent to speak concerning their respective fields and they do represent a very important group in medicine. They are leaders in thought in their fields and, therefore, are most important and necessary in American Medicine. No organization can afford to lose

their support. As the practitioner becomes the practical applicator of medicine—these men represent research, teaching and investigation—all are integral parts to American Medicine which enviously guards the health of the most fortunate nation of all times.

T. L. H.

IN DEFENSE OF LATIN

There is nothing pedantic about the use of Latin in medical conversation. The advantages of a standard nomenclature that affords exactness of expression cannot be over-estimated. Think of the confusion there would be without it in such descriptive subjects as anatomy and botany.

We applaud every effort to rid the profession of pose, pretense, and snobbery. However, if our patients are given a choice between two extremes, they would rather see us in silk hat with cane than in dunce cap and bells. At any rate, each patient has a right to expect a learned and dignified consideration of his case.

We are expected to know a cold by some name more signifying than just that. So why not speak of a pharyngitis or a rhinosinusitis once in a while, if that is what it happens to be? We complain of the dangerous prevalence of self medication. We complain of the lack of respect for the medical profession. Let us stop for a moment and think it over. Isn't it possible that we are fostering the very conditions we deplore because of a lazy carelessness on our own part? In serious consultations why should doctors call each other Tom and Bill unless it be to impress the poor patient with their boyish familiarity? The same indifference and carelessness is shown when these learned men speak before the patient of constipation, movable kidney, and Colle's fracture when the more exact terms of *stasis intestinalis*, *ren mobilis* and *fractura locus classica radialis* are available. There are, of course, two sides to this question, but perhaps it is a smile for the one and a guffaw for the other.

A. E. H.

THE INCREASING DEMANDS ALONG SOCIALISTIC LINES

Among the fairly recent socialistic developments arising from the political and economic conditions of the past several years have been the demands of the Workers' Alliance, alleged to be a nation-wide group of those persons who are now or have lately been on the relief rolls of the country at large. This week, in our neighboring town across the Red River, Moorhead, Minnesota, demands were made upon the town authorities as shown in the paragraph following this. While the material therein contained is not all strictly of medical interest, the subject as a whole is of vital interest to all citizens:

"The Alliance budget demands grocery allowance of from fifteen dollars (\$15) to ninety-seven dollars and fifty cents (\$97.50) per month for families ranging from one to twelve; for a daily milk allowance for each

person; for "reasonable" rent, ranging from \$10.00 to \$35.00 per month; for repairs, taxes, payments on mortgages, *etc.*, for persons owning their homes; for coal for cooking and a ton each month for seven months for heating; for gas, light, and water allowances; for replacement of household necessities; \$60.00 per year for adults and \$36.00 per year for children for clothing; car fare to work, school, relief hospitals, clinics and hospitals; \$3.00 per month for adults, \$2.00 for children for incidentals, recreation, *union dues* (!), school supplies and personal care; for medical care and for "adequate" burial grants. The Alliance budget, the speaker stated, is based on a national survey of needs of relief families. It was also claimed that to deny relief to persons owning automobiles is wrong, "since automobiles are often a necessity."

A. W. S.

HAMPTON RAY KENASTON, M.D. 1870-1937

In the passing of a pioneer physician after forty years of active practice in the west river country, there is much of value for the older man to meditate upon and more for the young man to feel encouraged and inspired over.

Doctor Kenaston was born under pioneer conditions near Elmwood, Nebraska, in 1870. Here he attended the public schools. He subsequently was graduated from the Chattanooga Medical College in 1898.

Immediately following his graduation, he located at Bonesteel, South Dakota, where he remained in active practice up to the time of his death. Doctor Kenaston was the first physician to settle in the Rosebud Country and the first coroner of Gregory County, when that section of the reservation was thrown open to settlement in 1904.

After pioneering in advance of the telegraph, railroad and telephone, with horse and buggy and with saddle bags, through mud and dust storms, blizzards and drouth, intermingled with sunshine, he accumulated a competence by dint of thrift, long hours of hard work

and study for nearly forty years. This permitted him the comforts of a beautiful home life with his wife and son, now grown, surrounded by a host of friends and his beloved books, all of which is truly a triumph in itself.

Doctor Kenaston was every inch a general practitioner and not only attended to the demands of a long and appreciative general practice, but also took an active part in the civic, cultural and educational life of his city, which he rarely forsook for any long period of time.

He was mayor of Bonesteel in 1917, establishing during his administration a municipal power plant and water system; president of the School Board in 1918, during which time a new and modern school building was constructed; and served as county chairman of the Liberty Loan Committee during the World War. He served for a number of years on the State Board of Health and Medical Examiners, where his executive ability, honesty and fairness were outstanding.

During his long residence in our state, he early manifested an active interest in organized medicine, being a charter member of the Tenth District Medical Society, a continuous member of the South Dakota State Medical Association and of the American Medical Association, for many years serving as chairman of the Board of Councilors of the State Medical Association.

Doctor Kenaston was a man serious and reserved, yet kindly disposed; rather a stoic in philosophy, conscientious but firm in his belief and in himself, spending evenings in his later years in study, a frequenter of medical societies, a clear thinker though reticent, a hard worker, with a multitude of friends but few intimates, tender and considerate in his home, trusted and beloved by his patients and highly respected by his profession.

We who knew him honor and admire him for the way he carried on to the end with that aggressive and determined spirit characteristic of him in his useful life. We honor him because he symbolized a type—the family physician—of his generation, who is rapidly disappearing from the scene of action.

S. M. H.

CASE REPORT

CARCINOMA OF THE LUNG WITH UNUSUAL COMPLICATIONS*

VIRGIL J. SCHWARTZ, M.D.
MINNEAPOLIS, MINNESOTA

Mrs. A. D., aged 56, was seen October 24, 1936. She had complained of cough and expectoration for the past three years, and had noted a loss of eighteen pounds in weight during the two preceding months. For several weeks there had been some hoarseness and moderate discomfort in the left chest, and during the past few days she had developed more hoarseness and considerable pain in the throat.

On that date several conditions were noted: 1. Inflammation, irregularity of the margins and thickening of both vocal cords and white patches on and above the false cords. 2. Pathology in the left chest. 3. Loss of motility of the right vocal cord. This might have been caused by either fixation due to direct

pressure of pathologic tissue on the laryngeal structures, or paralysis due to a lesion of the right inferior (recurrent) laryngeal nerve. The latter was the more likely. In other words, the patient apparently presented three distinct pathologic entities: 1. Acute laryngitis; 2. paralysis of the right vocal cord; 3. pathology in the left chest. There was no visible causal relationship between the first and the others, but the second and third seemed related. It was possible to explain a paralysis of the right vocal cord only by assuming that there may have been a metastasis from a left lung lesion to the right side of the mediastinum, or to the right side of the neck.

She was sent into the hospital where smears and cultures from the larynx showed a streptococcus infection. During the next few days under the customary treatment, this acute inflammation gradually subsided and the larynx returned to what was apparently its usual condition. The white patches disappeared and the cords remained moderately hyperemic. The right cord still was paralyzed. The patient had had, therefore, an acute inflammation superimposed upon a long-standing combination of severe cough, expectoration, and loss of weight. Gradually, she became able to eat and to retain her food, and the temperature became normal. Her only local complaint then

* Presented at the Eitel Hospital staff meeting, May 21, 1937.

was hoarseness, which was due to the fixation of the right vocal cord in a more or less cadaveric position with the resultant excessive space and leakage of air between the cords during phonation.

Roentgenograms were suggestive of carcinoma of the left lung; therefore, after the acute symptoms had completely subsided, a bronchoscopy was done under local anesthesia and there was found a small amount of mucus in both main bronchi and in the trachea. On the right side there was very little visible endobronchial pathology. In the distal portion of the left lower lobe bronchus the lumen appeared generally and markedly constricted; we thought this might be due to pressure of peribronchial tissue, such as a neoplasm. No definite evidence of an endobronchial tumor was seen. Near the upper end of the trachea there was an invagination of the lumen due to pressure upon the right postero-lateral tracheal wall. This was apparently due to a mediastinal mass pressing in from the right side, and we felt that this might be the cause of the right recurrent laryngeal nerve paralysis. The esophagus was also inspected and found entirely negative.

The diagnoses made on the basis of bronchoscopy were: 1. Mild bronchiectasis. 2. Probably carcinoma of the left lung originating either in the parenchyma, or in a small bronchiole of the lower lobe. 3. Probably a mediastinal mass in the right side compressing the trachea and the right recurrent laryngeal nerve.

The patient was allowed to go home, since deep X-ray therapy was not desired. During the course of the next few weeks, she became gradually weaker and developed motor and sensory paralyses of the pharynx and soft palate, with regurgitation and inability to swallow, so that tube feeding was necessary. The temperature began to rise, reaching 104°, the pulse rate and respiration became rapid, pneumonia developed and she died on November 20, 1936.

At autopsy there was found a large, hard mass of carcinomatous tissue in the lower lobe of the left lung, surrounding and compressing the left lower lobe bronchus. There were also smaller masses in the left lung of apparently similar tissue, and some large masses in the mediastinum, of which the largest was at the right of the trachea. This was unquestionably the reason for the paralysis of the right vocal cord and the tracheal compression. Microscopic examination revealed an adenocarcinoma of the left lung with some nodules in the right lung also and metastatic carcinoma of the mediastinal lymph nodes.

Autopsy confirmed the suspicion of malignancy of the left lower lobe with compression of the bronchus and of a metastatic mass in the right side of the mediastinum, causing pressure on the trachea and on the right inferior laryngeal nerve with paralysis of the muscles supplied by it. The acute laryngitis had confused the picture, since it was a transitory condition and not related in any way to the carcinoma.

REMOVAL OF AN UNUSUAL FOREIGN BODY FROM OESOPHAGUS WITHOUT BLEEDING OR TEARING

J. VERNON NEVILLE, M.D.

FORSYTH, MONTANA

Patient, age 12, admitted on August 13, 1937, during the evening, with the statement that she had swallowed a new sliding caster, and that she felt as though it had stuck in her throat. She had been holding it in her mouth and accidentally swallowed it three hours before being admitted. There was no cough nor shortness of breath, but some restlessness and the sensation of a foreign body in the throat. General health has been normal. A preliminary fluoroscopy visualized the caster in the oesophagus at about the level of the manubrium. Antero-posterior and lateral radiographs showed the caster in the oesophagus at the level of the first thoracic vertebra and lying in the lateral plane in contradistinction to foreign bodies of this shape lodged in the trachea, which usually lie in the antero-posterior plane. The sliding caster was of the nickel-plated type with a diameter the same as a 25c piece, and in addition, there were three parts of the edge turned down at right angles for



FIG. I.
Posterior radiograph showing
caster at level of the first
thoracic vertebra.

FIG. II.
Lateral radiograph; the
caster lying in the
lateral plane.

a distance of a quarter-of-an-inch and sharpened on the ends for fastening into the bottom of legs of furniture.

The problem was to extract the caster without having the nails tear the oesophagus during removal. The child was given an appropriate dose of morphine and atropine and general anesthesia was induced with ether. When completely relaxed, the body was held in the appropriate position and the Jackson esophagoscope was passed with little difficulty. The shining caster came into view. One of the three legs was grasped with the foreign body forceps and slow withdrawal was begun.

Very little force was necessary and the caster did not catch the wall at any point in its progress. There was only a very slight amount of blood-streaked secretion, and the patient was discharged in two days with normal temperature.

Societies

SCIENTIFIC PROGRAM OF THE MINNEAPOLIS CLINICAL CLUB

PROCEEDINGS

MINNEAPOLIS CLINICAL CLUB

Meeting of October 14, 1937

Dr. D. D. Turnacliiff, Presiding

PRIMARY CARCINOMA OF THE MALE URETHRA

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MINNEAPOLIS, MINNESOTA

While the urogenital tract as a whole shows a predisposition to the development of malignancy, the urethra is apparently quite resistant to such invasions. Because of the relative rarity of these cases, the following report is justified, especially since the patient had local metastases and has lived longer in good health than most of the reported cases.

Case Report

The patient was a male, aged 55, and a machinist. He was first seen on July 28, 1935, with a history of increasing difficulty in voiding associated with some pain and burning. There was at times noticeable a bloody purulent discharge. His symptoms had been present for about a month. However, for several months preceding, he had noted that upon coughing or straining some urine would escape.

The past history was negative except for the usual childhood diseases. He denied any venereal infection. There was no history of trauma. There had been some loss of weight and

anorexia. This the patient attributed to heat. The patient had had a generalized psoriasis for many years and over a period of 17 years had taken Fowler's solution.

The general physical examination was negative except for palpable glands in the groin, a purulent hemorrhagic discharge from the urethral meatus, and there was a mass about 3 by 6 cm. in diameter in the bulbar portion of the urethra. The stain of the discharge revealed mixed organisms, diphtheroids and streptococci. The mass on the under surface of the urethra was hard, and there was no evidence of fluctuation. Glands were palpable in both groins. An attempt was made to pass various instruments, which met with failure. Rectal examination revealed a small benign prostate.

The urine contained blood Grade II, and pus Grade III. The hemoglobin was 91%, and the white count 12,400.

The impression was (1) carcinoma of the urethra, or (2) periurethral abscess.

The patient was admitted to the hospital the following day and, under gas anesthesia, a short incision was made into the mass, and a section of tissue was removed for microscopic diagnosis. The microscopic picture was that of high-grade squamous cell epithelioma; so that operation proceeded with amputation of the penis, removing both crura down to the arch of the pubis. The corpus urethrae was freed and an attempt was made to get enough normal tissue to allow of perineal implantation of the urethra. However, in order to get posterior to the growth, it was necessary to remove the urethra as far back as the triangular ligament. The scrotal and perineal incisions were closed with Penrose drainage in the angles. Suprapubic cystostomy was then performed for permanent drainage, the reason being that unless enough normal urethral tissue can be implanted into the perineum there is always trouble with stricture formation. Following this, the patient's convalescence was uneventful except for a low-grade fever for ten days due to a mild infection in the perineum.

The patient was dismissed on the 19th postoperative day with the suprapubic tube in place. He returned to the hospital on September 3rd, 1935, feeling good. The physical findings had not changed. The hemoglobin was 84%, the white count 15,000. X-ray of the chest was negative. The urine contained pus II.

On September 4th, under gas anesthesia, a bilateral dissection of the groins was performed, removing the glands down to the external femoral ring. Following this the convalescence was again uneventful and the patient was dismissed from the hospital six days postoperatively. The patient was referred for X-ray therapy and was given two courses.

The pathological report on the tissue removed at the first operation revealed that the actual tumor was about $1\frac{1}{2} \times 4$ cm. with considerable infiltration around. There was a marked encroachment on the urethral canal. The microscopic diagnosis was squamous cell epithelioma, Grade III.

The microscopic diagnosis on the removed glands revealed metastatic malignancy of practically the same appearance as the primary tumor.

The patient's psoriatic lesions disappeared from the region of the groin and lower abdomen while he was on X-ray therapy. About six months after operation, the patient came into the office and the psoriatic lesions were papillary and angry-looking. He was referred to Dr. Laymon, who, upon study, determined that there was present malignant degeneration of both squamous cell and basal cell type. He treated these by excision in the case of some of the larger lesions and diathermy, and X-ray.

The patient has been seen frequently and is getting along well with his suprapubic drainage, and has learned to take care of the suprapubic tube himself and change it when necessary.

There has been no evidence of a recurrence now in two years and two months. The patient was last seen one month ago. He has continued working as a machinist for nearly two years. At present he is in good health except for a sciatic pain which has been bothering him for about six weeks. This, he states, is gradually improving without any treatment and he refused to have any investigation made as to the cause of the pain.

Incidence. The first case of carcinoma of the urethra was reported by Thiaudière¹⁷ in 1834, but there has been some question regarding the accuracy of the diagnosis in this case. The first authentic case was reported by Hutchinson⁵ in 1861. Wassermann¹⁸ published an extensive report in 1895. In 1907 Preiswerk¹⁴ collected 42 cases from the literature. Kretschmer⁷ collected 38 cases, including one of his own, from 1907 to 1923, bringing the total number to 80; while Kirwin⁶ collected 19 more from 1923 to 1932. In Kirwin's report there were included 99 males with carcinoma of the urethra, while only 96 females had carcinoma of the urethra, though recent reports indicate a larger percentage of the female urethra. I have seen three cases of carcinoma of the female urethra and only one case of the male urethra. Since Kirwin's report, Goldstein and Abeshouse⁴ collected 12 additional cases in the literature and added one of their own, bringing the total up to 112 reported cases; mine, reported above, being the 113th.

In the collected cases, primary carcinoma of the urethra occurred most often after the age of 55. Paton¹³ reported the youngest case, a Hindu boy age 18. One reported by Hutchinson was 22 years of age; while the oldest was in a man 91 years of age reported by Kroiss⁸.

Histopathology. In the male urethra, the normal lining varies in different parts, and only the distal portion (fossa navicularis) is lined with squamous cell epithelium; the prostatic portion with transitional, and the penile portion with columnar epithelium. Hence, in the male urethra, different cellular types of carcinoma are found. Histopathologic study of urethral carcinoma discloses there may be squamous cell, papillary and a columnar cell carcinoma. The most common type is the squamous cell, and occurred in 66 of the 80 cases reported by Kretschmer. The papillary carcinoma described by him, and the columnar cell type described by Cabot¹ occur frequently. Robb¹⁵, analyzing the histopathology of 76 cases, reported squamous cell carcinoma in 73%, adenocarcinoma in 21+%, papillary carcinoma in 3½%, while in the remainder there was one case each of columnar cell and transitional cell types. The adenocarcinomata that have been found have, of course, been due to malignant degeneration of Cowper's glands which are located in the perineum. From a review of the literature, these tumors can occur any place along the course of the urethral canal. Goldstein and Abeshouse call them penile when they include the fossa navicularis and the penile urethra, and perineal when they involve the bulbo-membranous and prostatic portions. The bulbo-membranous portion of the urethra is involved most frequently, from their study. Preiswerk found the cavernous and membranous areas involved in 38 out of 42 cases. In Diehl's series³ of 61 cases, the fossa navicularis was involved in two cases, the cavernous in 26, and the membranous in 33. The growths have been described by Kirwin and others as sometimes protruding from the external meatus.

Pathology. In the early stages, according to Goldstein and Abeshouse, urethral carcinoma may present itself as a localized growth, which later manifests a tendency to spread slowly and involve adjacent tissues. A protruding growth may be seen at the external meatus, in those cases involving the fossa navicularis. Growths located in the penile urethra and bulbo-membranous urethra show a tendency to spread and involve the remaining portion of the urethra, but the triangular ligament seems to protect against invasion into the prostate except in those cases where the tumor is entirely perineal. Invasion of the corpora cavernosa leads to disturbance of blood supply and the mass may become soft and friable and secondarily-infected. As the tumor grows, there is partial or complete obstruction of the urethra; and secondary infection, associated with fistula formation, is common. Extravasation of urine follows fistula formation in many cases. Metastases occur by way of the regional lymphatics apparently late in the course of the disease, and either the inguinal or iliac nodes, or both, may be involved. In most cases there is involvement of the inguinal nodes, and these may be detected by palpation. However, the fact that nodes are enlarged is no criterion of invasion. One case was reported by Montgomery¹⁰ in which the lumbar nodes were

involved and at autopsy no other metastases were found. Cases have been reported of distant metastases to the lungs and liver.

Etiology. The etiologic factors underlying the development of primary carcinoma of the urethra are still obscure. However, in many of the reported cases, predisposing factors have been present, particularly gonorrhea and its complications, non-specific urethritis, polypi formation, leucoplakia, or trauma—both chemical and mechanical. O'Neil¹² states that stricture was present in 50% of the cases, while Kirwin was of the opinion that there was a previous history of stricture in at least two-thirds of the cases. Kretschmer maintains that stricture should be regarded as an etiologic factor only so far as it might produce metaplasia or leucoplakia of the urethral mucosa. Robb reported a case which apparently developed in a gonorrheal stricture. This patient was instrumented 477 times over a period of six years. Scholl, Braasch and Long¹⁶ reported a case in which the patient had gonorrheal urethritis followed by stricture, which was dilated over a period of 20 years.

A history of antecedent leucoplakia has been mentioned by several authors. Trauma, either mechanical or chemical, has been considered next in importance to stricture formation as a predisposing factor. Young²⁰, Lower⁹, and Hutchinson have reported mechanical injuries to the perineum antedating the urethral malignancy, while trauma due to chemical irritation has been reported by Kretschmer and Culver².

Symptomatology and Diagnosis. The outstanding symptoms of urethral carcinoma are difficulty in urination and progressive diminution in the caliber of the stream. These symptoms, of course, characterize strictures of the urethra. In the early stages, without palpable mass or other criteria, the tumor is frequently overlooked in the belief that the symptoms are manifestations of a stricture requiring dilatation. As the growth progresses, however, the penis becomes thickened and indurated, and at times may assume a state of complete and painful priapism. The cutaneous tissues of the penis may become edematous. Upon palpation, an indurated mass is usually felt along the urethra. Not infrequently the patient complains of hemorrhagic urethral discharge. Hematuria may be variable. Loss of weight may be present, but is not a pronounced symptom in most cases. It is not unusual to have an associated peri-urethral abscess or fistulae, especially in those tumors involving the membranous urethra. It is in such cases that there is confusion in making the proper diagnosis. Pain may or may not be present.

The difficulty encountered in the diagnosis of carcinoma of the urethra, especially in the early stages, is to differentiate it from a non-malignant urethral stricture. However, suspicion should be aroused when a stricture fails to respond to a course of urethral dilatations, and especially when the discharge assumes a hemorrhagic appearance.*

The tendency of urethral carcinoma to invade the glands situated deeply in the crural canal, although a rather infrequent complication, makes it possible to establish the diagnosis by means of biopsy performed upon a gland. Endoscopy is a variable aid in establishing the presence of the disease. It cannot be employed in all cases, however, because of existing stricture which extends anterior to the tumor in many cases.

The condition should be differentiated from non-malignant stricture, perineal abscess, intraurethral chancre and tuberculosis.

Prognosis. The prognosis of urethral carcinoma is dependent upon the site of the lesion, the duration, extent of metastasis, and the presence of abscess or other infection. The outlook is better when the tumor is confined to the penile urethra, since this type is more amenable to operative removal. Where there is extensive abscess formation, fistulae, urinary extravasation or secondary effects on the upper urinary tract due to obstruction, the prognosis, of course, is poor. Seventy-nine per cent of 72 cases collected by Watson¹⁹ were dead within six months after operation. In many of these, however, the operation was purely a palliative procedure. Oberlander¹¹ reported a case living 4½ years. Braasch and Scholl reported a case living 5 years following surgery.

* Lazarus, J. A., *J. Urology* 31:823-831. (June), 1934.

Treatment. In many instances the patients either come in too late, or there is too long a delay in making a diagnosis, so that any treatment is more or less palliative. In selected cases, the treatment of choice is radical operation, amputating the penis with dissection of both glands and crural canals. Total emasculation is not necessary. The scrotum and testicles can be saved and from the psychological standpoint, this is important. In selected cases, electrocoagulation and application of radium, if instituted early, should prove of value provided there are no inguinal gland metastases. In a case reported from the Mayo Clinic, the lesion was excised, the defect was repaired by the use of the section of the saphenous vein, and the patient received 250 mgm. of radium to the tumor area. The patient was reported alive 4½ years later. In 1929, Watson reported two cases of urethral carcinoma treated successfully by radium therapy. Lower reported two cases treated by local resection of the urethra which was performed with end-to-end anastomosis. Stricture followed in both cases. X-ray therapy has its greater value or usefulness postoperatively.

Summary

One case of carcinoma of the urethra is added to the 112 cases reported. It would seem, however, that there are more cases which have been unreported to date, since Dr. Cabot, of Rochester, recently told me he had seen three cases in the last two years.

It is important to make an early diagnosis in order to improve the prognosis. There can be confusion with peri-urethral abscess, peri-urethritis associated either with or without gonorrheal or traumatic stricture or tuberculosis.

Any stricture of the urethra which persists for a long time, does not respond to treatment, and which is accompanied by hemorrhagic urethral discharge, should be looked upon with suspicion. There is no harm in making a biopsy on suspected cases.

The treatment of choice is radical amputation of the penis with block dissection of the inguinal and crural lymph nodes, followed by radiotherapy.

The case herein reported might possibly be due to arsenical ingestion over a long period. Arsenic is deposited in squamous epithelium and, while the epithelium in the penile urethra is not of the squamous type, it is not improbable that the deposit might have been made in a squamous epithelial nest.

The prognosis in the case reported will depend not only on the possibility of distant metastases from the urethral carcinoma but also upon the malignant degeneration of his psoriatic lesions.

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Discussion

Dr. C. D. CREEVY: When the announcement of this meeting came I thought that Dr. Meland would have had a hard time picking out anything more difficult to discuss from personal experience. Carcinoma of the urethra is very rare. I have seen one case in the male, and that one serves to emphasize what Dr. Meland said about confusion with periurethral abscess because this patient, a man of 65, had perineal fistulae with a purulent discharge. I was so convinced, since they had followed catheterization for acute retention, that here was a periurethral abscess that when the pathologist reported that tissues from the abscess wall was a squamous-celled carcinoma I did not believe it. After curetting the "abscess" cavity and packing it with iodoform gauze, I was pleased to have it heal nicely except for a small fistula. An attempt to close the fistula surgically disclosed a large cavity in the perineum which had remained exactly as it was in the beginning, while the skin healed over it. The removal of more tissue confirmed the diagnosis of carcinoma of the urethra.

Another thing that suggests the diagnosis is the presence, in an elderly man, of persistent and unreasonably profuse bleeding after the dilatation of a stricture.

Dr. CARL W. LAYMON: It is interesting to speculate in this case as to whether or not the cutaneous findings were related to the urethral malignancy. The patient had suffered with psoriasis for many years and, as Dr. Meland said, had taken Fowler's solution for a long period of time. About 30 years later, multiple cutaneous malignancies developed. Reports of similar cases are not uncommon in the literature. In this particular case, the carcinomas varied from the ordinary flat non-ulcerated type of superficial epithelioma to cauliflower-like proliferative, ulcerated lesions.

Arsenic, in its inorganic form, has an affinity for the epidermis and may stimulate multiplication of the cells or pigment production, resulting in the well-known clinical findings of arsenical warts or keratoses, especially on the palms and soles, and hyperpigmentation. It does not seem unreasonable to assume that in certain instances, the arsenical stimulation is of such intensity that outright malignancy is precipitated. Such a view, however, is not accepted by all observers and there has been considerable debate as to whether or not multiple carcinomas, occurring in psoriatics who have previously taken arsenic, are actually due to the drug. Dr. Nelson Anderson of Los Angeles, who recently reviewed the subject, is of the opinion that arsenic is the cause. Dr. Montgomery, of Rochester, on the other hand, does not accept such a view.

In the Mexican arsenic mines it is said that most workers ultimately develop arsenical keratoses and cutaneous cancers, evidence which rather strongly suggests that arsenic is at times an important carcinogenic agent. If this holds true for the skin, it may at least be argued that the same drug may have been a factor in the urethral malignancy. Of course, no far-reaching conclusions may be drawn from the study of only one case.

Dr. ORWOOD J. CAMPBELL: It is unfortunate that the most common way in which carcinoma of the urethra is recognized is through failure to obtain results in dilating what is thought to be a stricture. From the therapeutic standpoint, it is obviously undesirable to dilate a carcinoma of the urethra. Of course, the tremendous predominance of benign strictures of the urethra would justify a continuance of the present method of handling strictures, but I am wondering if the occasional incidence of malignancy would not justify more frequent biopsy and in favorable cases, excision of the stricture.

I should also like to ask what Dr. Meland's experience has been in excising inguinal lymph nodes. When I was doing surgery at the University Hospital, I recall that the incidence of infection following such a dissection was extremely high.

Dr. C. D. CREEVY: I believe that excising strictures, because of the possibility of the development of malignancy, would be comparable to taking off the breasts at the menopause because of the same possibility. I have seen quite a few patients with strictures, but I have never recognized but one carcinoma of the urethra.

I have never contrived to get by with dissection of the inguinal glands without having the wound break down. I was very much disturbed about it, because no one who reports such operations says anything about trouble with the wounds afterward. I asked Dr. Counsellor at the Mayo Clinic about it, and he said that they had had the same difficulty. I think it is probably because the arrangement of the lymphatics in that area is such that an inguinal dissection results in almost complete removal, and thus makes the wound much more susceptible to the infection which is usually already present in the inguinal nodes.

Dr. E. L. MELAND: I do not think that one would be justified in trying to excise strictures of the penile urethra, because you would meet with failure quite regularly. Any stricture accompanied by diffuse hemorrhage or a bloody purulent discharge, or associated mass, I think should probably be explored, and certainly I do not see any harm in making a biopsy in any case where there is a question.

Malignancy of the urethra and the penis is usually infected. It has been the experience of many men that inguinal wounds break down if the groin dissection and the amputation of the penis are done at the same time. That is the reason I did the groin dissection at a later date, when the element of infection was largely removed.

HEART LESIONS FROM AN INSURANCE STANDPOINT

KARL W. ANDERSON, M.D.†
MINNEAPOLIS, MINNESOTA

Since I was invited to join this organization as a representative of the group in insurance medicine, it seems fitting that my introductory paper should be in that field. I have chosen a broad subject—the heart from the standpoint of life insurance—but of necessity I shall have to limit my remarks to a discussion of those impairments which permit of insurance, and where there is a sufficient number of cases in which the material has been studied statistically.

In a life insurance home office, the only cardiac impairments available for study are in cases that we insure knowing that they are impaired, or those where a cardiac impairment develops during the time policies are held on their lives, so that we are able to follow them to the consummation of their contracts. The greater part of my discussion concerns the systolic murmur, as this is the most common heart murmur which insurance companies encounter. It is not only the most common murmur, but also one regarding whose seriousness there is still a wide difference of opinion among the medical profession. The mortality rates which I will quote are based on actual deaths. They do not all, of course, die a cardiac death, but we are interested in the fact that they do die prematurely.

I feel that I must at this time say a few words about the type of examination on which these figures are based, as their value would naturally depend upon the accuracy of the examining physician. It is fair to assume that most doctors try to do good work in their insurance examinations, but no doubt some impairments are overlooked or not properly described, so that an impaired risk may occasionally be classed as standard. Since I am discussing substandard types of insurance, we shall consider only those cases in which a definite cardiac impairment has been found and reported.

I believe that in general the work done by the examining physician is good, and that most of the doctors are reporting the impairments and histories as they obtain them. We are aware that there is some collusion between some of the doctors and agents; but I feel that this is not of sufficient significance to change materially the value of the mortality figures which I will quote.

In interpreting and considering cardiac impairments from the insurance standpoint, we must realize that there is a difference between the insurance viewpoint and that of the general practitioner or cardiac specialist. It is important that the private physician give his patients an optimistic assurance concerning

* Given before the Minneapolis Clinical Club, October 14, 1937.

† Assistant medical director, Northwestern National Life Insurance Company, Minneapolis.

their heart condition, but insurance companies must be very realistic in their attitude, because they must back up their judgment with money.

During the period in which Laennec first introduced the stethoscope, all extraneous sounds heard over the heart by the clinician were considered to be of serious significance. This was probably due to the fact that most of the examinations were made only at the deathbed. Consequently, from hearing cardiac impairments at that time, they felt that all abnormal sounds over the heart were of importance, even though a patient might be enjoying good health. This conception, however, has gradually swung to the other extreme through the teaching of Cabot and others, minimizing the interpretation of cardiac murmurs. Through that period the doctors were basing their judgment entirely upon the few cases which they saw in their private practice, and most of them did not have the opportunity of following these cases through to death. They saw many cases in their routine examinations where heart murmurs were found in which their patients had seemingly been enjoying good health for some years. This affected not only the attitude of the medical profession toward heart murmurs, but also the insurance viewpoint, which made the companies too liberal and lenient in their interpretation of heart murmurs. As a result of this attitude, the life insurance companies have lost untold millions. A popular doctor was the one who would give a favorable prognosis and do what was necessary to minimize cardiac and other impairments. It has been stated that in the medical profession we have Hope, Faith, and Charity—diagnosis being a matter of faith, prognosis a question of hope, and treatment too often an affair of charity. Today we are going through another change in cardiac interpretation. This period had its inception following Herrick's paper in 1919, concerning coronary disease. It was a direct result of correlating post-mortem findings with clinical symptoms. Previous to this period most of the papers written on cardiac subjects usually covered the general question of heart murmurs, and their relationship to rheumatism and other infectious diseases. This change in viewpoint is justified when you realize that only 45% of cardiac deaths are due to inflammatory lesions of the heart, and 55% of cardiac deaths, according to Dr. Clawson¹ are due now to non-infectious processes, of which hypertension is the most important. The seriousness of this type of heart disease is well-illustrated by the fact that there is a very marked increase in the cardiac deaths which are due to the so-called non-infectious processes, of which the most important is the coronary group. Coronary sclerosis and cardiovascular disease cause over 400,000 deaths in the country annually. It is more evident when we note the result of the recent analysis of 100 large claims totaling over \$70,000,000² reported to the Medical Directors' Association, where 28 died of cardiovascular disease within five years of their examinations by a number of good examiners. The cases were all accepted on a standard basis. This new cardiovascular problem is facing both the insurance companies and the medical profession at the present time. We realize the seriousness of this problem by the marked increase in deaths due to cardiovascular disease each year. However, this is a problem that warrants a separate discussion.

We have some very interesting figures concerning heart murmurs and their relationship to infectious diseases. In 1928 a committee was formed to determine the best method of making available all medical material which the various companies had accumulated in the past. It was decided that this group was to study all the material which the companies had available from 1909 to the anniversaries of the policies under consideration in 1928. The total number of entrants dealt with in these studies was about 2,100,000. There were 41,000 deaths, and the average age at assuming the policies was 40.2 years. Dr. Hunter, vice president and actuary of the New York Life Insurance Company,³ was chairman of the final committee, the group being made up of a joint committee from the Actuarial Society of America and the Association of Life Insurance Medical Directors. The companies participating in this study had four-fifths of the total insurance in force in the United

States and Canada. A considerable amount of work was entailed in this study, as the committee considered every impairment mentioned in the life insurance examinations. However, this paper will be limited to their findings in the section on heart disease.

In studying the heart murmurs they tried to use the same terms that doctors in the field use in describing them.

TABLE I.³

Functional murmurs	Apex murmur, systolic, constant, not transmitted.
	Apex murmur, systolic, inconstant.
	Basic murmur, aortic area, systolic, constant, not transmitted.
	* Basic murmur, aortic area, systolic, inconstant.
	Basic murmur, pulmonic area, systolic, constant, not transmitted.
Mitral Regurgitation	Apex murmur, systolic, constant, transmitted to the left.
Mitral Obstruction	Apex murmur, presystolic or diastolic, constant.
Aortic Obstruction	Basic murmur, aortic area, systolic, constant, transmitted upward.
Aortic Regurgitation	Basic murmur, aortic area, diastolic, constant, transmitted downward.

* There was not a sufficient number of cases on the basic murmur, aortic area, systolic, inconstant, to have any statistical value.

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The classification of murmurs used by the examining physicians for the companies prior to 1925 was divided into five types—functional murmur, mitral regurgitation, mitral obstruction, aortic obstruction, and aortic regurgitation. This necessitated the doctors' making definite diagnoses. The committee then decided to try to make a new classification as indicated in Table I, in which the murmurs were described as at the present time by the average doctor doing the examining for the company. The company does not require a diagnosis, but wants its examiners to describe what they hear in modern medical language. The committee felt that they could group most of the murmurs described by the doctors into nine classifications, which would simplify the study. The clinical criterion for separating organic heart disease from nonorganic or functional is not well defined. The functional heart murmurs have been described and classified under the first five types.

As insurance is based entirely upon relative averages, it was necessary to have some basis for comparison, and they took as a standard those risks that present no impairment or such minor ones that they are accepted at the regular standard rate as determined by the American Men's Table, while those considered substandard were those presenting impairments of such a serious nature that an extra premium was necessary to cover the hazard involved. Individuals eligible for a standard policy would on a numerical basis be rated 100%. Any impairment that the applicant might have is evaluated and then added to the basic rating of 100%. For example, if a man on examination has a systolic murmur that is interpreted to be of significance, a definite numerical value is given to this impairment, and the man is charged an extra premium. When I speak of an increased mortality of 175%, therefore, I mean that allowances have to be made in charging a sufficient extra premium so that the mortality will equalize one without this impairment. In other words, if 1,000 cases for a certain age group with a certain impairment have a mortality of 175%, that is 75% higher than the standard, and the companies on that group will have 75% more deaths than for a corresponding group of lives considered to be standard or normal.

Table II³ is a résumé of the studies conducted on the so-called functional heart murmurs.

TABLE II.³
Substandard Risks

TYPE OF MURMUR—NOT TRANSMITTED	Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
A. Apex murmur, systolic, constant, not transmitted to left, found on examination	30,943	234	149.74	156%
B. Constant systolic murmur in pulmonic area	25,503	124	110.80	112%
C. Inconstant systolic apical murmur	9,803	59	43.01	137%
D. Basic murmur, aortic area, systolic, constant	5,708	35	25.70	131%

(There were not a sufficient number of cases on the basic murmur, aortic area, systolic, inconstant, to have any statistical value.)

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TABLE III.³

TYPE OF MURMUR	Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
A. Apical murmur, systolic, constant, transmitted to left	118,634	1,231	549.08	224%
B. Same as above but occupation of insured involving only light work, such as clerical, managerial, or professional	107,285	1,095	502.69	218%
C. Same as A, but insured doing manual labor	11,349	136	46.39	293%
D. Apical murmur, systolic, constant, transmitted to left with moderate hypertrophy	9,122	196	41.20	476%

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It is evident in studying this table that some of these murmurs could be considered of no importance, while others, particularly the first group (A) in Table II—the apical murmur, systolic, constant, not transmitted and found on examination, are of serious significance. Of this type they had a sufficient number exposed and followed so that the mortality, which was found to be 156% of the expected, is of definite value. In other words, it showed that there was a 56% greater mortality than was expected in a similar group of lives without this impairment and everything else normal. This type of murmur, therefore, should not be considered unimportant, and an extra premium should be charged in order to equalize the expected mortality.

Under (B) in Table II, where the actual ratio of mortality was only 110%, it is apparent that this type of murmur could be accepted on a standard basis, and one might make the assumption that this is the only true functional murmur, as the others in this group have a definite increased mortality. While (C) and (D) show a definite increase in the ratio of mortality it is not very marked, but high enough to raise the question as to whether this type of case should ever be accepted on a standard basis. My personal reaction is that groups (C) and (D) should be charged an extra premium, that is, they should not be issued on a standard basis taken as a group. In the classification of basic murmurs, aortic area, systolic, inconstant, there were not a sufficient number of cases to have any statistical value. However, I feel that I would be very hesitant to accept any of these cases on a standard basis. Group (A)⁵ has been further studied according to age groups. In the group from 15 to 34 years of age there were 103 deaths, with an excess mortality of 184%, and in this study it is interesting to note that as they got older there was a corresponding decrease in mortality, which would indicate that this murmur in the younger ages is apparently in most cases on an organic basis, as the mortality for the entire group was only 156%.

The murmurs that I have been discussing so far belong to that group in which there is the most disagreement in interpretation by the medical profession. The rest of the murmurs under discussion I believe can be considered due to organic heart conditions, even though there may not be a history of rheumatic fever or other infectious diseases which are thought to affect the heart. This part of the study has been divided into four classes, the first class being re-divided into four sections, as illustrated in Table III³.

This is the group of apical murmurs, systolic, constant, transmitted to the left, without the history of rheumatic fever or other infectious diseases. Of this group there were 118,634 exposures, with a ratio of actual to expected deaths of 224%. The evidence therefore is convincing that the constant systolic murmur at the apex, transmitted, is a serious impairment, with

the actual mortality more than double the expected. The seriousness of this impairment is better illustrated by the fact that many companies do not accept risks where the numerical rating is over 225%. The average company's rating for this in the past has been 175%, but according to this study it is evident that this rating should be materially increased, and probably one of the reasons for this liberal attitude in the past has been due to the teaching of Cabot and others, minimizing this impairment. The relationship of occupation to this type of impairment is very interesting and enlightening. The exposures have been subdivided according to those doing light work, such as clerical, managerial, and professional, in comparison to those doing manual labor. The variation in mortality of 218% for those doing light work, and 293% for those doing hard work, proves statistically that it is good advice to recommend that this type of case choose their occupation with care. It is very interesting to note the effect on mortality of the presence of hypertrophy with this murmur. There were 9,122 exposures with actual deaths of 196 and expected deaths of 41.2, with a mortality ratio of 476%. There might, however, be a question as to whether the average doctor is in a position to determine a cardiac enlargement without the benefit of a six-foot plate of the heart. The average doctor uses the terms slight and moderate to indicate hypertrophy. Assuming that he may be wrong in many cases in which he diagnoses a slight hypertrophy, but that he is more often correct in the group where moderate hypertrophy is indicated, they excluded the group in which the question of only a slight hypertrophy was involved. It is evident from these figures that the doctors were correct in most of the cases, as indicated by the extreme increase in mortality in this type of murmur without the history of rheumatic fever.

A history of rheumatic fever associated with the finding of a systolic murmur has always been thought to be of significance by the medical profession, but I do not believe that they realize how important it is unless they have had the opportunity to study a large series of those cases.

In studying this table of cases in which there is a finding of an apical murmur, constant, transmitted to the left, with a history of rheumatic fever or other infectious disease, the importance of this history is evidenced by the mortality of 329% in this group, compared with a mortality of 224% for the same type of murmur without this history—over 100% increase in mortality. It is interesting to compare the experience with the same history in the cases without tonsillectomies and those with tonsillectomies recorded, as there was no appreciable difference in mortality. I think this is an important contribution in view of the discussion that is prevalent now as to the value of the continuation of the wholesale removal of tonsils. It is also interesting to compare cases with this type of murmur who

TABLE IV.³

Apex murmur, systolic, constant, transmitted to the left, with history of rheumatism or other infectious disease.

	Exposed to Risk	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
A. With history of rheumatism	20,521	307	92.63	329%
B. With history of rheumatism with tonsillectomy recorded	1,810	20	6.16	325%
C. With history of rheumatism without tonsillectomy recorded	18,711	287	86.47	332%
D. With history of other infection	9,470	76	42.04	181%
E. With history of rheumatism and slight or moderate hypertrophy	8,736	158	37.42	465%

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TABLE V.⁴
MITRAL REGURGITATION

Substandard Issues of 1925 to 1931 Carried to Anniversaries in 1933.

DESCRIPTION OF IMPAIRMENT	Actual Deaths	Ratio of Actual to Expected Deaths by Table on Standard Lives
With no unfavorable features:		
No hypertrophy	80	169%
Slight hypertrophy	35	185%
Moderate hypertrophy	25	370%
With a report from other sources than Company's records of any impairment of borderline significance, such as history of albumin, casts, sugar, abnormal blood pressure, rapid pulse, etc., not found on examination:		
No hypertrophy	45	172%
Slight or moderate hypertrophy	61	642%
With history of rheumatism:		
No other unfavorable features:		
Without hypertrophy	33	220%
With hypertrophy	65	462%
One or more other unfavorable features:		
Without hypertrophy	41	349%
With hypertrophy	37	604%

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give a history of rheumatic fever with the group where they have had other infectious diseases thought to have affected the heart, such as tonsillitis, chorea, measles, typhoid fever, and scarlet fever, as this latter group had a rather favorable mortality of but 181% compared with the former. It illustrates again the seriousness of the history of rheumatic fever in comparison to other infections. The significance of slight to moderate hypertrophy when associated with this type of murmur and history is more evident than in the other table. The mortality of 465% illustrates the fact that with the finding of hypertrophy they are absolutely uninsurable.

When you bring into this discussion the question of a diastolic murmur with a history of rheumatic fever, we do not have many cases. Very few applicants have been insured when the home office knew that there was a diastolic or pre-systolic murmur present. In the medical impairment study, there were only 2,247 exposed to this risk, with actual deaths of 41, expected deaths of 8.55, and a mortality of 480%. This does not include cases where the examining doctor felt there was any type of hypertrophy, but from what figures we have, it is apparent that when you add again hypertrophy to the above, it would approximately double the mortality, making the ratio of actual to expected deaths 800%.

Dr. E. J. Campbell made a further study, using the material of the New York Life Insurance Company on policies issued on a substandard basis from 1925 to 1931 to the anniversaries of the policies in 1933, and the result of his work is illustrated in Table V⁴.

There are several things which I think should be emphasized in this chart. First, that with the history of a systolic murmur and no other unfavorable history, that is, without a history of rheumatic fever or hypertrophy, there was an actual mortality ratio of 169%, which is somewhat greater than the findings in the medical impairment study, but it again confirms the viewpoint that this type of murmur should not be accepted on a standard basis. The mortality on cases with a systolic murmur and only moderate hypertrophy was 370%, as compared with a

mortality of 476% found in the medical impairment study. We feel that this is an indication that from 1925 on there has been a better type of examination done by the average doctor. In other words, there has been a better selection than there was between 1909 and 1925, and this is probably the reason for the saving in mortality in this group.

Table VI⁴ gives a summary of the medical impairments studied, and is self-explanatory.

Conclusions

1. The constant systolic murmur at the apex which is not transmitted, often considered a functional murmur, according to this study should be classified as an organic murmur and an extra premium should be charged.
2. A history of rheumatic fever with a finding of a systolic murmur is of serious significance.
3. The occupation of the individual must be considered in cases in which there is a systolic murmur associated with a history of rheumatic fever.
4. Tonsillectomies had practically no effect on the ultimate mortality in cases where there was a history of rheumatic fever.
5. The finding of hypertrophy with or without a history of rheumatic fever makes the case practically uninsurable.
6. The finding of a presystolic or diastolic murmur makes the mortality so great that such cases are as a group uninsurable.

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TABLE VI.⁴
MEDICAL IMPAIRMENT STUDY (1929)

Issues of 1909 to 1927 Carried to the Anniversaries in 1928. Cases Treated as Substandard Risks

TYPE OF MURMUR	Actual Deaths	Ratio of Actual to Expected Deaths by Table on Standard Lives
Systolic Apex Murmur, constant, transmitted to left:		
Without hypertrophy	1,231	224%
With slight hypertrophy	394	234%
With moderate hypertrophy	196	476%
Systolic Apex Murmur with History of Rheumatism:		
Without hypertrophy	307	331%
With slight or moderate hypertrophy	158	422%
Systolic Apex Murmur with History of Infection other than Rheumatism:		
Without hypertrophy	103	189%
Systolic Apex Murmur, constant, not transmitted:		
Without hypertrophy	234	156%
Systolic Basic Murmur, aortic area, constant, transmitted upwards:		
Without hypertrophy	134	257%
Systolic Basic Murmur, pulmonic area, constant, not transmitted:		
Without hypertrophy	124	112%

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Discussion

Dr. T. A. PEPPARD: I should like to remark about a few factors not directly in relation to statistics. There seem to be styles in medicine the same way there are styles in a great many other things. What I was taught when I went to school has changed a good many times since I have been out. The teaching of a few years ago, that a systolic murmur heard over the apex was of little significance, as a matter of fact, a thing to be often disregarded, is followed by statistical papers which brought out the fact that the mortality in these people was greater than those who did not show such a finding. We must take history, physical examination, laboratory and X-ray data, in fact all that we can determine, into consideration to approximate a correct conclusion relating to the condition present in any particular patient. It seems that the profession at large is in the habit of according undue weight to auscultation when examining the heart. A few years ago, MacKenzie of England made the remark that it was too bad the stethoscope was ever invented and our friend, Dr. S. Marx White, made the remark that information gained by stethoscopic examination was, in the considerable proportion of cases, "the music after the meal." I am not asking that less attention be paid to auscultation, but that more attention be paid to inspection, palpation and percussion. Percussion is often times inaccurate because of the limited skill of the percussor, or the physical condition which obtains in the patient, such as emphysema which may make it impossible to approximate the heart's size in this manner. Observation of the location and character of the apex beat is important and worth observing and recording. Careful palpation may reveal the presence of a thrill and point the way to a certain conclusion.

Dr. Anderson's statistics are of a special significance because of the great volume of material observed, and this volume would seem to indicate that there must be some element of correctness in the conclusions drawn.

Dr. JAY C. DAVIS: Dr. Anderson's paper has brought out some very interesting points. In some people there may exist a very faint, so-called, functional murmur in the pulmonic area which under proper conditions—by that I mean a quiet room—may be found to exist also in the second right interspace and which may be accompanied by a faint diastolic murmur heard in the second right interspace, second left interspace, and sometimes in the third left interspace. These murmurs may be due to an aortic valve lesion. If this diastolic murmur is not picked up, this person would be classified incorrectly in Dr. Anderson's group.

Regarding hypertrophy of the heart, as soon as that exists one always must realize that pathology is present which usually is due to valve involvement, hypertension, or coronary disease.

After forty years of age, another problem presents itself, namely, coronary disease, many of whom have a systolic murmur.

Dr. JOHN M. LAJOIE: I enjoyed Dr. Anderson's paper very much and I am very much interested in what he had to say. There are two or three observations I would like to make. One is that a diastolic murmur may be missed if the heart rate has been increased by exercise. The rate should be low to easily hear some diastolic murmurs.

I have noticed in the last year or two that medical directors with whom I am familiar are very skeptical about heart conditions. I suppose the reason for this is the high rate of mortality attributed to heart disease. If all insurance cases were examined in the quiet of the doctor's office, fewer heart murmurs would be missed at the original examination.

In all probability the reason for the old standard of charging and rating, used at the present time is that insurance companies have to make money some way, since they cannot make it by buying United States Bonds.

Isn't it true that from the agent standpoint you get a much better type of man selling life insurance than you did ten years ago?

Dr. KARL ANDERSON: In reply to the question as to what the insurance companies are doing to obtain the services of better qualified men to sell insurance, the Chartered Life Underwriter's degree is a coveted possession of life insurance agents. It takes a considerable amount of study to obtain this degree, and the agent must pass very rigid examinations and requirements. This is doing much to increase the efficiency of agents and to get the better type of men interested in this field of selling.

LAWRENCE R. BOIES, M.D.,

Secretary.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS CANBY PHYSICIAN'S LICENSE SUSPENDED FOR TWO YEARS

In the Matter of the Revocation of the License of John Lynn Erickson, M.D.

Following a hearing held by the Minnesota State Board of Medical Examiners on November 12, 1937, the license to practice medicine held by John Lynn Erickson, M.D., of Canby, Minnesota, was suspended for a period of two years. Dr. Erickson was cited to appear before the Board because of conduct unbecoming a person licensed to practice medicine and detrimental to the best interests of the public. The citation was issued following an investigation made by the Board into the circumstances surrounding the death of a patient of Dr. Erickson, and the use of alcoholic beverages by Dr. Erickson. It was also brought out at the hearing that Dr. Erickson had

been convicted on October 31, 1937, in Lincoln County of driving a motor vehicle while under the influence of intoxicating liquor.

Dr. Erickson was born at Canby, Minnesota, February 10, 1888. He is a graduate in medicine at the University of Minnesota in 1923, and was licensed by the Minnesota Board the same year. Dr. Erickson has practiced at Twin Valley, Hendricks and Canby, Minnesota.

WORTHINGTON OSTEOPATH FINED \$250.00 AND COSTS FOR UNLAWFUL PRACTICE OF MEDICINE

STATE OF MINNESOTA *vs.* DUNN

On November 30, 1937, Donald J. Dunn, 45 years of age, entered a plea of guilty to an information charging him with practicing medicine without a license. Dunn, who holds a license to practice osteopathy but not medicine, and who maintains an office at Worthington, Minnesota, was sentenced by the Honorable Charles A. Flinn, Judge of the District Court, to pay a fine of \$250.00 plus the court costs, or serve four months in the Nobles County Jail. Dunn paid the fine plus court costs of \$6.90, or a total of \$256.90.

The Minnesota State Board of Medical Examiners had received a number of complaints that the defendant was injecting medicine and furnishing medicine to be taken internally. The investigation disclosed that Dunn had written a number of prescriptions to be taken internally, but that he had neither written the name of the patient upon the prescriptions, nor had he signed them. The particular case upon which a complaint was filed, concerned a young man who stated that he consulted the defendant and had been advised that he was in a run-down condition and suffering from an inflammation of the kidneys and the bladder. He stated that the defendant gave him a number of hypodermic injections in the arm and some pills to be taken internally. He stated that he also received a bottle of so-called blood medicine to be taken internally and a written prescription for a second bottle of the same medicine. He stated that he received a bill from the defendant in the sum of \$162.00. The patient stated that he did not get any better and upon consulting a physician, was advised that he was suffering from a different condition than that stated by the defendant. He also stated that he has made considerable improvement since being under medical care.

The osteopathic law of Minnesota specifically provides that osteopathy

"is hereby declared distinct from that of medicine or surgery * * * Osteopathic physicians, when duly licensed, shall have the right to practice osteopathy * * * including the use and administration in connection with the practice of obstetrics, minor surgery and toxicology only of anaesthetics, narcotics, antidotes and antiseptics."

The law also provides:

"Except as hereinbefore expressly authorized as to the administration of anaesthetics, narcotics, antidotes and the use of antiseptics, the license shall not authorize the holder to give or prescribe drugs for internal use."

—(SECTIONS 5736-5737, *Mason's Minnesota Statutes for 1927.*)

ITASCA COUNTY PRACTITIONER PLEADS GUILTY

Re. STATE OF MINNESOTA vs. SMITH

On December 10, 1937, Christopher Columbus Smith, 77 years of age, entered a plea of guilty to an information charging him with practicing healing without a basic science certificate. Smith entered his plea of guilty before the Honorable Graham M. Torrance, Judge of the District Court at Aitkin, Minnesota. After hearing the facts, Judge Torrance sentenced Smith to a term of four months in the Itasca County Jail, and placed him on probation until September 13, 1938, on a number of conditions, two of which are that Smith absolutely refrain from practicing medicine in any manner, or from holding himself out to the public as a physician.

Smith moved into northern Itasca County in 1920, and resided on a farm about a mile east of Effie. In 1930 he was given a warning by the State Board of Medical Examiners to refrain from practicing medicine, and he stated at that time that if given an opportunity he would return to the State of Texas. However, he did not leave and in 1933, following a fire, he moved into Effie, where he built a small place and has continued to practice medicine until the time of his arrest on December 9th, 1937. Smith stated to the Court that he was born in Fannin County, Texas, and raised in Daviess County, Missouri. He stated that he attended the old Medical School at Keokuk, Iowa, graduating in 1885, and being licensed by the Iowa State Board of Medical Examiners in 1886, holding license number 1050. He also stated that he had never been convicted of a crime. Judge Torrance warned the defendant that under no circumstances could he be permitted to practice medicine. It was stated to the Court that the sanitary conditions at Smith's residence, where he maintained his office, were very bad.

The State Board of Medical Examiners wishes to acknowledge the fine cooperation of John J. Benton, County Attorney, and Sheriff Elmer Madson.

MINNEAPOLIS WOMAN PLEADS GUILTY TO SALE OF CONTRACEPTIVES

Re. STATE OF MINNESOTA vs. CECELIA SCOTT

On November 22, 1937, Mrs. Cecelia Scott, 30 years of age, entered a plea of guilty in the District Court of Hennepin County at Minneapolis, to an information charging her with the unlawful sale of contraceptives. Mrs. Scott is not licensed to practice any form of healing in the State of Minnesota and resided at 118 West 39th Street, Minneapolis. After a statement of the facts to the Court the defendant was sentenced by the Honorable Arthur W. Selover, Judge of the District Court, to pay a fine of \$75.00 or serve sixty days in the Minneapolis Work House. Mrs. Scott paid the fine, and stated to the Court that she would obey the law in the future.

Mrs. Scott stated that she came to Minneapolis in the spring of 1937, from Kansas City, Missouri; that she represented The Smith Laboratories, Corp., and that they had an office at 408 Wesley Temple Building. According to the literature distributed by Mrs. Scott, The Smith Laboratories are the sole manufacturers of Colagyn and Phyllassogyn. Mrs. Scott did not confine her contacts to the medical profession but went to private homes because of information that she obtained through the daily birth notices in the Minneapolis newspapers. She charged \$6.00 for her so-called "set" and refills were sold at the rate of \$2.00 each. When police women called upon Mrs. Scott they were told, among other things, that a physical examination could be arranged for them at the office of Arthur Kolling, a chiropractor in Minneapolis. Kolling has no license to practice medicine in the State of Minnesota, and already has a previous conviction for practicing medicine without a license. Mrs. Scott stated that she had no business connection of any kind with Kolling but had learned of him through a customer. She stated that she had no knowledge that he was a chiropractor.

For the convenience of the medical profession, the laws of the State of Minnesota on this subject are as follows:

"Every person who shall sell, lend, or give away, or in any manner exhibit, or offer to sell, lend, or give away, or have in his possession with intent to sell, lend, give away, or advertise or offer for sale, loan or distribution, any instrument or article, or any drug or medicine, for the prevention of conception or for causing unlawful abortion; or shall write or print, or cause to be written or printed a card, circular, pamphlet, advertisement, or notice of any kind, or shall give oral information, stating when, where, how, of whom or by what means such article or medicine can be obtained or who manufactures it—shall be guilty of a gross misdemeanor, and punished by imprisonment in the county jail for not more than one year, or by a fine of not more than five hundred dollars, or by both."—(SECTION 10188, *Mason's Minnesota Statutes for 1927.*)

"Every person who shall deposit or cause to be deposited in any postoffice in the state, or place in charge of any express company or other common carrier or person for transportation any of the articles or things specified in Sections 10187, 10188, or any circular, book, pamphlet, advertisement, or notice relating thereto, with the intent of having the same conveyed by mail, express, or in any other manner; or who shall knowingly or wilfully receive the same with intent to carry or convey it, or shall knowingly carry or convey the same by express, or in any other manner except by United States mail—shall be guilty of a misdemeanor. But the provisions of this section and Section 10188 shall not be construed to apply to an article or instrument used by physicians lawfully practicing, or by their direction or prescription, for the cure or prevention of disease."—(SECTION 10189, *Mason's Minnesota Statutes for 1927.*)

A WARNING FROM THE MINNESOTA STATE BOARD OF MEDICAL EXAMINERS CONCERNING THE HANDLING OF NARCOTICS

TO THE MEMBERS OF THE MEDICAL PROFESSION OF MINNESOTA:

During the year 1937 the Minnesota State Board of Medical Examiners found it necessary to summon 21 Minnesota physicians before the Board for violations of the Harrison Narcotic Law and for drug addiction. Fourteen physicians were in trouble because of infractions of the law relating to the prescribing or dispensing of narcotics to addicts while seven of the physicians were before the Board because of habitual indulgence in their own use of morphine. The seven cases involving addiction were referred by the Narcotic Bureau to the Medical Board for disposition. In the other group four out of the fourteen physicians were indicted by the Federal Grand Jury and all pleaded guilty. Fines totaling \$1300 were paid by two physicians; two physicians were placed on probation. The remaining ten physicians were permitted to submit offers in compromise totaling \$1275 and in addition their cases were referred to the Medical Board.

The Medical Board conducted hearings at each Board meeting during the year on these cases. Each case was investigated by Mr. Brist, attorney for the Board, prior to the hearing. In every case involving addiction of the physician the Board orders the surrender of the stamp tax and right to dispense or prescribe narcotics. In three of the cases involving addiction the physicians are not practicing. In one case the physician was ordered not to practice pending treatment; in another case the suggestion was made that the physician retire from the practice of medicine. In the other group ten out of the fourteen physicians were voted a reprimand; the license to practice medicine of another was revoked, while the other three lost their privilege of dispensing and prescribing narcotics.

The youngest physician before the Board was 26 years of age while the oldest was 80. Four physicians in the first group involving addiction were members of the Minnesota State Medical Association. In the other group five out of the fourteen physicians were members of the Minnesota State Medical Association. The Board was quite surprised to hear several of the younger physicians who are recent graduates of the University of Minnesota state that they had no knowledge of the provisions of the Harrison Law and that they were quite certain they had not heard about it in the Medical School. The Medical Board believes that it would be very advantageous to the medical profession if more emphasis were placed on this subject in the medical curriculum. A suggestion might be to invite a well-versed member of the Narcotic Bureau or United States Attorney's office to give a lecture each year to the medical students and in addition the Medical Board would be very glad to cooperate by furnishing a member of the Board to give a friendly lecture on the problem as the Board views it from their experience.

In conclusion the Medical Board wishes to state that they do not intend to be as lenient in the future in these cases. The

stock excuse of most physicians is that they were "framed." Is it not quite a task to frame a physician who practices medicine in good faith, particularly one who insists on examination and diagnosis? Can good faith even enter the picture when the fundamentals of medical practice are absent and prescriptions are sold at \$5.00 each? The Medical Board does not approve of some of the tactics used in the past in obtaining evidence to enforce the narcotic laws, but if every physician will remember what a Federal Judge said in sentencing a Minnesota physician for a violation of the Harrison Law he will have no occasion to appear either before the Narcotic Bureau, in Federal Court or before this Board—the statement was—"the mere fact that you are educated as a physician presupposes intelligence." The Board has made an honest effort to cooperate with the Narcotic Bureau, the United States Attorney's office and the Federal Court. After reviewing these cases the Board believes that considerable leniency has been shown the physicians involved, by the various governmental agencies, and insofar as the Medical Board is concerned unless that leniency is rewarded with a reduction in these cases to a very minimum, there will be more licenses to practice medicine revoked. The Board desires to be friendly and fair but it has a duty to perform and unless it does perform it some other agency will probably be asked to do it. The Medical Board invites the sincere cooperation of every person practicing medicine in this state and respectfully asks that this matter be given the attention that its seriousness warrants at medical meetings throughout the state. The Board is fully aware of the fact that these 21 cases do not represent the total number of physicians in Minnesota who violate the Harrison Narcotic Law and a decided improvement is assuredly in order.

Remember, when a person comes into your office asking for narcotics, the answer is "No!"

This statement issued by order of the Minnesota State Board of Medical Examiners this 12th day of November, 1937.

(Signed)

(SEAL)

JULIAN F. DuBOIS, M.D.,

Secretary.

News Items

Dr. Merlyn John Lindahl, Pipestone, Minn., has moved to Sherburn, Minn.

Dr. John P. Hiebert, Minneapolis, has been elected chief-of-staff of Asbury Hospital.

Dr. Verne I. Lacey, who established the first hospital in Lake Andes, S. D., has moved to Yankton to become a partner of Dr. John E. Trierweiler.

Dr. Lewis L. Mayland, Great Falls, has been re-appointed physician for Cascade County in Montana, by the board of county commissioners.

Dr. William E. Hodgkin, Kalispell, Mont., has moved to the new Kalispell Clinic Building; and Dr. G. B. Wright is his new partner.

Dr. Louis J. Pankow, Sioux Falls, S. D., spoke before the student body of Sioux Falls College on December 9 on "Socialized Medicine."

Dr. John Eiler, formerly of St. Bonifacius, Minn., has located at Park Rapids, in the Citizens National Bank Building.

Dr. Fred Franklin Attix, Lewistown, Mont., has been elected a governor of the American College of Surgeons for Montana. His term expires in 1940.

Dr. Herrick John Aldrich, formerly of St. Paul and Belview, Minn., has moved to Watertown, S. D.

Dr. Charles Thomas Bergen, of Britt, Iowa, a graduate of the University of Minnesota Medical School in 1933, has located in Blue Earth, Minn.

Dr. Edward J. Zeiss, Wildrose, S. D., has removed to Chicago to become resident physician at the Cook County Hospital, and Wildrose now has no physician.

Powers Lake in North Dakota now has a community hospital, opened on December 1. It is managed by Dr. Robert Goodman.

The St. James Hospital in Butte, Montana, has a new surgery room which doubles the operating capacity of that institution. It was opened on December 10, 1937.

Dr. Edwin Diment Perrin, of Toledo, Ohio, a graduate of the University of Indiana School of Medicine in 1932, has associated with the Quain-Ramstad Clinic in Bismarck, N. D.

Dr. Charles A. Swanson, mayor of Poplar, Montana, and chairman of the Poplar School Board, will settle in Columbus, Mont. He had been in Poplar since 1928.

Dr. Creighton P. Farnsworth, Chamberlain, S. D., has purchased the Canova Hospital at Canova, and will manage it henceforth. It was operated until January, 1937, by the late Dr. Carl A. Feige.

Dr. Jesse Walter Foster, Wessington Springs, S. D., for 15 years a physician in that town, has located at Ankeny, Iowa.

Dr. Walter Henry Darling, 64, assistant superintendent of the Minnesota State Hospital for the Insane at St. Peter from 1895 until 1908, died at Anoka on December 6, 1937. He had lived at Anoka for 8 years.

Dr. J. Anthony Malerich, formerly of Caledonia, Minnesota, has purchased the Shakopee Hospital, and will remodel it to accommodate ten beds. Dr. Malerich came to Shakopee (Minnesota) in 1931.

Seventy-three hospitals in the state of Minnesota are on the list of those approved for 1937 by the American College of Surgeons, it was announced at the clinical congress of the college in Chicago.

A two-story sunroom and a new tile floor on the ground floor, will be added to the Marshall Hospital at Marshall, Minnesota, according to Dr. Frank D. Gray, medical superintendent.

Dr. Alvin Perry Scheib, Hitchcock, S. D., is leaving that city to take over the practice of Dr. K. P. Caveny, of Elkton, who has been forced by illness to close his office.

Dr. Arthur A. Whittemore, former officer of the North Dakota State Department of Health, is moving from Napoleon to Wishek to open practice. He had been at Napoleon for three and one-half years.

Saint Joseph's Hospital in Minot, N. D., has a new operating table costing \$800. It was donated to the hospital by the Saint Joseph's Hospital Guild of Minot. Dr. Martin Joseph Fardy is chief-of-staff of the hospital.

Dr. Leon Harry Flancher, superintendent of Sand Beach Sanatorium, Lake Park, Minnesota, addressed about 95 Clay County rural teachers at Moorhead, Minnesota, on October 20, 1937.

Dr. Lazlo Ormandy, of Budapest, Hungary, brother of Eugene Ormandy, former conductor of the Minneapolis Symphony Orchestra, now conductor of the Philadelphia Orchestra, is a fellow in surgery at the Mayo Clinic, Rochester, Minnesota.

Dr. Henry E. Michelson, professor of dermatology in the University of Minnesota Medical School, delivered a paper on syphilis before the medical sciences section of the American Association for the Advancement of Science at Indianapolis, Indiana, on December 29, 1937.

Dr. Henry W. Meyerding, Rochester, professor of orthopedic surgery in the University of Minnesota Graduate School of Medicine, spoke before the Watertown District Medical Society at Watertown, S. D., on November 23, 1937, on "The Treatment of Fractures."

Dr. A. S. Rider, Flandreau, S. D., was elected president of the Inter-Allied Council of Lake, Moody, Brookings and Kingsbury Counties in South Dakota, on November 18, 1937. Mr. C. A. Locke, Brookings, is vice president; and O. H. Lawrence, D.D.S., is the secretary.

Dr. F. Emerson Daigneau, 75, of Austin, Minn., died on December 10, 1937, at his home. He was graduated from the University of Vermont College of Medicine at Burlington in 1886, and came to Austin after practicing in Saint Paul for a time.

Dr. Luisa Kerschbaumer, of the Minnesota State Hospital for the Insane at Saint Peter, has several of her paintings on exhibition at the University of Minnesota in Cyrus Northrop Memorial Auditorium under the auspices of the Union of Minnesota Painters.

Dr. Robert Joseph Holzberger, formerly with the Cottonwood Coal Company in Sand Coulee, Mont., has established practice in ophthalmology, otology, and rhinology in the Medical Arts Building in Great Falls, Montana.

Dr. Louis W. Allard, orthopedic surgeon to St. Vincent's Hospital in Billings, Mont., examined 150 patients in Butte on November 23 and 24, as a result of the clinic held in Butte by the Auxiliary for the Rehabilitation of Crippled Children of that city.

The fifth E. Starr Judd Memorial Lecture will be delivered in the medical science amphitheater of the University of Minnesota on February 2, 1938, at 8:15 P. M., by Wilder G. Penfield, Litt.B., M.D., B.Sc., M.A., D.Sc., F.R.C.S., professor of neurosurgery and director of the Neurological Institute of the McGill University Faculty of Medicine in Montreal, Canada. Dr. Penfield will speak on "Cerebral Circulation in Epilepsy."

The city of Townsend in Montana in Broadwater County will have a new \$30,000 hospital and clinic building. The two physicians in part owning it are Dr. Raymond G. Bayles and Dr. Frank P. Nash, both of Townsend. The structure will care for 15 patients, and will have nurses' quarters.

Dr. Maysil Williams, North Dakota state health officer, announces to physicians that three motion picture films dealing with venereal diseases are available. One may be secured from the Fargo Health Department; and the other two are owned by the North Dakota State Department of Health.

The Minnesota Pathological Society met in the Institute of Anatomy, University of Minnesota, on December 21 at 8:00 P. M., to hear Dr. Ernst Gellhorn, professor of physiology in the University of Illinois College of Medicine, speak on "The Pathologic Physiology of Anoxia of the Central Nervous System."

Dr. James Kerr Anderson, Minneapolis, instructor in surgery (proctology) in the University of Minnesota Medical School, spoke before the Kandiyohi-Swift-Meeker Counties Medical Society on December 8, 1937, on "The Office Treatment of Common Ano-Rectal Pathology." The meeting was held at Willmar.

Dr. John D. Leith, 76, died in McCreary, Manitoba, on December 14. A graduate of the Medical Faculty of Trinity University in Toronto in 1894, Dr. Leith had practiced medicine at Larimore, Petersburg, Inkster and Milton in North Dakota before he moved to McCreary in 1914.

Dr. William Robert Shortridge, of Flasher, who has practiced medicine in North Dakota for 32 years, was honored on his 70th birthday on December 14 by residents of Flasher. In March 1938 Dr. Flasher will celebrate the 40th anniversary of his admittance to practice medicine.

Dr. Gilbert J. Thomas, Minneapolis, associate clinical professor of urology in the University of Minnesota Medical School, has been made an honorary life member of the Buenos Aires Urological Society in South America. Dr. Thomas is past president of the American Urological Association.

Dr. Joseph Edward Honoré Garand, 63, of Dayton, Minn., died on December 12, 1937, at his home. He was graduated from the Laval University Faculty of Medicine in Quebec, Canada, in 1899; and practiced in Dayton from the year of his graduation until his death. He had been mayor and member of the school board.

The Freeborn County Medical Society (Minnesota) selected Dr. Lowell Colvin Barr, Albert Lea, as its president for the coming year. Dr. Sidney A. Whitson, Alden, is the new vice president; Dr. Leo R. Prins, Albert Lea, is the new secretary; and Dr. Daniel Leo Donovan is the treasurer. Dr. Paul Gamble, Albert Lea, will represent the society at the state medical convention.

Dr. Elmer Julius Beithon, Hankinson, is the new president of the Richland County Medical Society of North Dakota. Dr. James Howard Hoskins, Wahpeton, is the new vice president; Dr. Andrew M. Thompson, Wahpeton, is secretary. Dr. Beithon will represent the society at the state medical convention.

Dr. Olaf Bentzen, of Grand Forks, North Dakota, a graduate of the King Frederick University Faculty of Medicine, Oslo, Norway, in 1893, and a physician in Grand Forks since 1905, has sold his practice to Dr. Victor Sigvald Quale, of that city. Dr. Betnzen will reside in Florida.

Dr. Osmer S. Randall, Watertown, S. D., has been chosen president of the Watertown District Medical Society for 1938. Dr. E. Sheldon Watson, of Estelline, is vice president; Dr. Marvin Edward Adams, Clark, is the secretary-treasurer; Dr. Russell H. Brown, Watertown, is the new censor; and Dr. Anders Einar Johnson, Watertown, is the society's delegate to the state medical convention.

The first month's report of the Lewis and Clark County Consolidated Health Service in Montana shows a great diversity of services rendered, according to Dr. Reginald G. M. Ehlers, Helena, superintendent. School children accounted for 1,038 physical examinations; there were 7 class room talks by the department; two public lectures; 111 smallpox vaccinations, 124 diphtheria vaccinations; 7 tuberculin tests; 15 clinic visits; 3 consultations with physicians; 19 school sanitary inspections and 3 to private premises; 3 water supply samplings and one swimming pool sample; and 220 visits to cases, contacts or suspects in disease control.

NEW RADIATION THERAPY INSTITUTE TO BE OPENED AT MILLER HOSPITAL

An X-ray installation called "the largest and most advanced of its kind" will be ready for operation January 1st, in the Charles T. Miller Hospital in St. Paul. The apparatus is a 1,200,000 volt constant potential Kelly-Koett Therapy machine and will be under the direction of Dr. Edward Schons and Dr. J. P. Medelman. The apparatus will be capable of treating four patients simultaneously and is especially designed to treat deep-seated tumors. The X-ray tube, built of indestructible porcelain and metal, is 30 feet long, and is protected by 4 inches of lead. The target (the X-ray producing electrode) is of copper 5 inches in diameter, one millimeter thick, protected by a thin layer of lead. Water, flowing under pressure, cools the target. The tube yields roentgen rays of extremely short wave length. The operator is protected from the radiation by very thick concrete walls lined with lead. Very adequate measuring equipment will provide for constant control of the quality and quantity of radiation being used. The apparatus itself called for the construction of a new addition to the new wing of Miller Hospital. The project has been under construction for the past two years.

LIST OF PHYSICIANS LICENSED BY THE MINNESOTA STATE BOARD OF MEDICAL EXAMINERS
ON NOVEMBER 12, 1937
OCTOBER EXAMINATION

Name	School	Address
Arkin, Archie Abraham	U. of Manitoba, M.D. 1932	919 Russell Ave. N., Minneapolis
Beizer, Lawrence	Harvard U., M.D. 1934	Mayo Clinic, Rochester
Bellis, Carroll Joseph	U. of Minn., M.B. 1936, M.D. 1936	University Hospital, Minneapolis
Benesh, Louis Alfred	U. of Minn., M.B. 1937	1412 E. 24th St., Minneapolis
Benkowitz, Karl Burton	U. of Rochester, M.D. 1934	University Hospital, Minneapolis
Bennett, Robert Leo, Jr.	U. of Pittsburgh, M.D. 1936	Mayo Clinic, Rochester
Berlin, Anthony Salvatore	U. of Minn. M.B. 1937, M.D. 1937	362 Ramsey St., St. Paul, Minn.
Black, Benjamin Marden	Stanford U., M.D. 1936	Mayo Clinic, Rochester
Black, John Robert	McGill U., M.D. 1934	Mayo Clinic, Rochester
Boysen, John Edward	U. of Minn., M.B. 1936, M.D. 1937	Pelican Rapids, Minn.
Brown, Henry Allen	Med. Col. of Va., M.D. 1934	Mayo Clinic, Rochester
Browne, Harry C., Jr.	U. of Ore., M.D. 1935	Mayo Clinic, Rochester
Brumm, Harold J.	Rush Med. Col., M.D. 1936	Mayo Clinic, Rochester
Cabell, Charles Lorraine	U. of Va., M.D. 1934	Mayo Clinic, Rochester
Cameron, David Molloy	U. of Texas, M.D. 1935	Mayo Clinic, Rochester
Conway, John Francis	U. of Rochester, M.D. 1935	Mayo Clinic, Rochester
Cottrell, Lillian	U. of Colo., M.D. 1936	University Hospital, Minneapolis
Cowan, Donald William	U. of Minn., M.B. and M.D. 1931	520 Wash. St. S. E., Minneapolis
Craft, Charles Brigman	Tulane U., M.D. 1935	University Hospital, Minneapolis
Davies, Roberts Judson	U. of Minn., M.B. 1933, M.D. 1934	Nopeming, Minn.
Dees, Myrta Susan Coons	Johns Hopkins, M.D. 1934	University Hospital, Minneapolis
Delmonico, E. Joseph	Syracuse U., M.D. 1930	Mayo Clinic, Rochester
Dublin, William Brooks	U. of Cal., M.D. 1936	Mayo Clinic, Rochester
Engle, David Edwin	Indiana U., M.D. 1934	Mayo Clinic, Rochester
Foster, Furman Lamar	U. of Minn., M.B. 1936, M.D. 1937	801 E. River Road, Minneapolis
Freedman, Harold Charles	U. of Minn., M.B. 1937	Minneapolis General Hospital, Minneapolis
Freeman, William Neil	U. of Chicago, M.D. 1937	415 Third Ave. S., St. Cloud, Minn.
Goodson, William Hammack, Jr.	Harvard U., M.D. 1934	Mayo Clinic, Rochester
Grindlay, John Happer	Harvard U., M.D. 1935	Mayo Clinic, Rochester
Grove, M. Stuart	U. of Minn., M.B. 1934, M.D. 1935	Ancker Hospital, St. Paul
Hammer, Howard John	Wayne U., M.B. 1934, M.D. 1935	Mayo Clinic, Rochester
Heise, William von Rohr	Northwestern, MB. 1934, M.D. 1935	259 E. Broadway, Winona
Hildebrand, Alice Grace	U. of Neb., M.D. 1936	Mayo Clinic, Rochester
Judd, Edward Starr, Jr.	Rush Med. Col., M.D. 1937	Mayo Clinic, Rochester
Kernan, Phillip Donald	U. of Wis., M.D. 1933	4234 Harriet Ave., Minneapolis
Kimmel, George Charles, Jr.	U. of Minn., M.B. 1936, M.D. 1937	University Hospital, Minneapolis
Koch, Eleanor Alice Steele	Johns Hopkins, M.D. 1934	Mayo Clinic, Rochester
Lange, Elizabeth Greason Hunter	U. of Mich. M.D. 1928	2713 Delaware St. S. E., Minneapolis
Leighton, Robert Sisson, II.	U. of Minn., M.B. 1937	Minneapolis General Hospital, Minneapolis
Madding, Gordon Francis	Northwestern, M.B. 1936, M.D. 1937	Mayo Clinic, Rochester
Mitchell, Mancel Talcott	U. of Minn., M.B. 1934, M.D. 1935	University Hospital, Minneapolis
Muir, Walter Francis	U. of Minn., M.B. 1937, M.D. 1937	Graceville, Minn.
O'Brien, Louis Timothy	U. of Minn., M.B. 1935, M.D. 1936	Wahpeton, N. Dak.
Olds, John Whitney	Rush Med. Col., M.D. 1936	Mayo Clinic, Rochester
Pearman, Robert Oliver Davidson	Harvard U., M.D. 1935	Mayo Clinic, Rochester
Peters, Stanley Bruce	U. of Rochester, M.D. 1935	Virginia, Minn.
Ralph, Robert Douglas	Queen's U., M.D. 1932	Mayo Clinic, Rochester
Schiele, Burtrum Clarence	U. of Colo., M.D. 1931	University Hospital, Minneapolis
Schmitz, Anthony A.	U. of Minn., M.B. 1937	Minneapolis General Hospital, Minneapolis
Schneider, Herbert Hoyt	U. of Kansas, M.D. 1936	Mayo Clinic, Rochester
Seedorf, Everett Emil	U. of Wis., M.D. 1936	Mayo Clinic, Rochester
Seldon, Thomas Harry	Queen's U., M.D. 1929	Mayo Clinic, Rochester
Skinner, Ira Clifton, Jr.	Tulane U., M.D. 1935	Mayo Clinic, Rochester
Smith, Baxter Allen, Jr.	U. of Minn., M.B. 1936, M.D. 1937	University Hospital, Minneapolis
Spink, Wesley William	Harvard U., M.D. 1932	530—5th St. S. E., Minneapolis
Sturley, Rodney Francis	U. of Minn., M.B. 1937	Minneapolis General Hospital, Minneapolis
Swartz, Frederick Charles	U. of Cincinnati, M.B. 1931, M.D. 1932	Mayo Clinic, Rochester
Templin, David Browning	U. of Chicago, M.D. 1937	Mayo Clinic, Rochester
Thomas, Margaret Jane	U. of Minn., M.B. 1936, M.D. 1937	500 Harvard St. S. E., Minneapolis
Trach, Benedict	U. of Minn., M.B. 1937	U. of Chicago Clinics, Chicago, Ill.
Trueman, Kenneth Rankine	U. of Manitoba, M.D. 1934	Mayo Clinic, Rochester
Vickers, Paul Merton	U. of Minn., M.B. 1936, M.D. 1937	Mayo Clinic, Rochester
Waisman, Morris	U. of Ill., M.D. 1936	Mayo Clinic, Rochester
Watterson, Kenneth Ward	U. of Pittsburgh, M.D. 1929	Mayo Clinic, Rochester

Name	School	Address
Wellman, Thomas Gibbs	U of Minn., M.B. and M.D. 1937	Lake City, Minn.
Wollaeger, Eric Edwin	Harvard U., M.D. 1934	Mayo Clinic, Rochester
BY RECIPROCITY		
Dix, Christopher Robert	U. of Wis., M.D. 1935	Mayo Clinic, Rochester
MacKay, Alexander Russell	Northwestern, M.D. 1936	Mayo Clinic, Rochester
Walsh, John Joseph	Jefferson, M.D. 1935	Mayo Clinic, Rochester
Rcsenblatt, Louis Mayo	U. of Nebr. M.D. 1932	NPBA Hospital, 1515 Charles St., St. Paul, Minn.
Langmack, William August	Marquette U., M.D. 1936	Cloquet, Minn.
Leland, John Augustin Charles, Jr.	Jefferson Med. Col., M.D. 1936	4367 Webber Parkway, Minneapolis
Soniat, Theodore Louis Lucian	Tulane U., M.D. 1935	Mayo Clinic, Rochester
NATIONAL BOARD CREDENTIALS		
Hartwell, Donald Clifford	Col. of Med. Evang., M.D. 1937	Wayzata, Minn.
Harris, William Elsworth Stanley	U. of Minn., M.B. 1936, M.D. 1937	NPBA Hospital, 1515 Charles St., St. Paul, Minn.
Pratt, Sidney Charles	U. of Minn., M.B. 1936, M.D. 1937	1335 Oliver Ave. N., Minneapolis
Sather, George Allen	Rush Med. Col., M.D. 1937	Fosston, Minn.

Book Notices

ON THE BLOOD

Atlas of Hematology, by EDWIN E. OSGOOD, M.A., M.D., and CLARICE M. ASHWORTH; 1st edition, green cloth, gold-stamped, 203 pages plus appendix, references and index, 22 tables and 325 illustrations and frontispiece in color; San Francisco: J. W. Stacey, Inc., Publisher (236-238 Flood Building); 1937. Price, \$10.00.

Some of the illustrations in this *Atlas* were exhibited at the Cleveland session of the American Medical Association in 1934; and requests following that exhibition prompted Dr. Osgood to produce this book. His thesis is (1) that good therapy depends upon accurate diagnosis, (2) that a systematic hematologic study will greatly aid the diagnosis of almost any disease, and (3) that such hematologic examinations are simple enough to be performed by any qualified practitioner of medicine. Dr. OSGOOD, who is assistant professor of medicine in the University of Oregon Medical School at Portland, has shown superb judgment in selecting the cells for reproduction, and it can be said that Miss ASHWORTH, the illustrator, has evolved some very beautiful plates. *THE JOURNAL-LANCET* recommends this book to all physicians as a puissant aid.

A NEW FORMULARY

Modern Treatment and Formulary, by EDWARD A. MULLEN, M.D., with a foreword by HORATIO C. WOOD, Jr., M.D.; flexible blue cloth, gold-stamped, 706 pages, no illustrations; Philadelphia: The F. A. Davis Company; 1936. Price, \$5.00

This is a very useful little volume for any physician to own, and is particularly so to the general practitioner. For some time it seemed that therapeutic reliance upon drugs was on the wane; now, however, with the great research work being done in biological chemistry and physiological chemistry, the validity of many forms of drug therapy is being re-established.

MULLEN, who is assistant professor of pharmacology and physiology in the Philadelphia College of Pharmacy and Science, has provided more than two thousand prescriptions in this book, coupled with short treatments for the condition under consideration. There is a good section on differential diagnoses; and there is a physician's interpreter, which enables the physician to converse with his patient adequately in any of five languages.

OUTSTANDING WORK ON PULMONARY CARCINOMA

Primary Carcinoma of the Lung, by EDWIN J. SIMONS, M.D., with a foreword by J. ARTHUR MYERS, M.D., Ph.D.; 1st edition, blue cloth, gold-stamped, 240 pages plus bibliography and index, 30 figures, frontispiece in color; Chicago: The Year Book Publishers, Inc.; 1937. Price, \$5.00.

Dr. MYERS points out in the foreword of this new work that primary carcinoma of the lung constitutes no less than 10% of all cancers of the human body. Dr. SIMONS' book might stand alone on the consideration that it is one of the very few volumes on the subject; but it has much more than circumstantial merit to commend it. It is almost unique in the fact that fully half of it is devoted to clinical considerations. The author has wisely chosen to make primary carcinoma of the lung possible of diagnosis by the general practitioner. Every symptom complex suggestive of the condition is given. The most indicative physical signs are presented. Insofar as it is possible, the differential diagnosis between pulmonary carcinoma and tuberculosis is reduced to a table. Bronchoscopy is fully described and illustrated. The 5,000 histologically proved cases cited and analyzed, and the splendid bibliography both demonstrate the prodigious amount of conscientious labor that went into the making of this book. *THE JOURNAL-LANCET* recommends it without qualification.

FOR THE PRESCRIBING PHYSICIAN

The Art of Compounding, by WILBUR L. SCOVILLE, Phm. D., D.Sc., and JUSTIN L. POWERS, Ph.D.; 6th edition, washable heavy green cloth, 61 illustrations and 620 pages, gold-stamped; Philadelphia: P. Blakiston's Son & Company; 1937. Price, \$4.75.

There are still many physicians who both prescribe and compound. There are even physicians who have an interest (or possibly own outright) in a pharmacy. Any physician who compounds his own prescriptions will find this standard authority an excellent source book. The practical side is not forgotten in this volume—instead of following by rote the dogmatic modes of previous texts, the authors include *specialized* information from experienced dispensers concurrently in practice. Thus, the information presented in this work is alive and vital. It is a pleasure to behold such a work. It is worth while to point out that a key to state board examinations is also included. Nearly 900 prescriptions will be found in this book. *THE JOURNAL-LANCET* recommends it.

Dr. SCOVILLE formerly was professor of the theory and practice of pharmacy in the Massachusetts College of Pharmacy. Dr. POWERS is assistant professor of pharmacy in the University of Michigan at Ann Arbor.

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February, 1938

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Dr. J. A. Myers,
Chairman, Board of Editors,
The Journal-Lancet,
Minneapolis, Minnesota.

Dear Dr. Myers:

I am very happy to learn that THE JOURNAL-LANCET will devote its February 1938 issue entirely to papers written by Fellows of the American College of Physicians residing in North and South Dakota, Montana and Minnesota.

I believe this will be good evidence of the type of work which the American College of Physicians is carrying on. The College looks upon itself as an institution for the promulgation of medical wisdom and the application of personal research and experience to the problems of daily practice.

It seems altogether fitting to me that THE JOURNAL-LANCET should provide the College's members from this group of states an opportunity to demonstrate their progress in this direction.

The American College of Physicians is happy to introduce this issue of THE JOURNAL-LANCET. Personally, I offer both the Fellows whose work is represented herein and THE JOURNAL-LANCET itself my congratulations and best wishes.

Sincerely yours,

J. H. Means

J. H. Means, M.D., President
AMERICAN COLLEGE OF PHYSICIANS
Boston, Massachusetts

JHM:EAL

Coronary Disease Simulating Insulin Reactions

Report of a Case

John L. Calene, A.B., M.D., F.A.C.P.

Aberdeen, South Dakota

THE SYMPTOMS of hypoglycemia, resulting from an overdose of insulin are, by now, nearly universally known. The frequency with which excessive doses of insulin are being used to produce hypoglycemia in the treatment of schizophrenia is also being well-publicized. The fact that even these exaggerated symptoms, resulting from huge doses of insulin in the schizophrenia treatment, respond so quickly to the introduction of glucose, has practically removed all fear of insulin reactions from the minds of the medical profession.

Hundreds of diabetics use insulin without even considering the possibility of over-dosage. Protamine insulin, with its occasional severe reactions, has forced some patients and doctors to be more careful, it is true. Yet this report will show that it is possible to confuse the symptoms of hypoglycemia with more serious conditions over a long period of time.

Coronary disease and its complications, occlusion and thrombosis, has, in recent years, stamped its dreadful symptoms very forcibly upon medical minds. It is almost impossible to miss the significance of the well-defined late symptoms of excruciating severe precordial, usually radiating pain, accompanied by shock, fear of death, *etc.*, in the patient of middle age or older. Earlier symptoms and findings of coronary conditions are being constantly brought to attention in medical papers everywhere. The fact that severe coronary disease may be manifested by less striking and less alarming symptoms is being stressed by many writers.

All diabetic textbooks emphasize the fact that coronary disease is a very common complication of diabetes. Joslin,¹ Wilder, and others have repeatedly stated that coronary occlusion and thrombosis is a major cause of death in older diabetics. They have likewise noted the earlier occurrence of this condition, even in younger diabetics. Attempts to correlate this fact with various diabetic diets and other factors have been frequently made. As a result of this, sudden death in a diabetic patient is known to result rather commonly from various coronary conditions.

The unexpected demise of one of my diabetic patients of thirty-five years of age has prompted me again to call attention to the fact that coronary complications can be present in the younger diabetic without even being suspected by competent medical men. The possibility of confusing insulin reactions with attacks of coronary disease will be brought out by my case report. The value of autopsies in all sudden deaths in the diabetic will again be emphasized. Perhaps, some at least, will not be so free to blame insulin for all disagreeable

symptoms in their diabetic patients. Certainly, as Joslin has frequently said, no death should be ascribed to insulin unless a post mortem examination has been made.

My case report is as follows:

A woman, age 34, came to me in March, 1935. Her mother had died of diabetes in her late fifties. There was no other diabetes in the family. Her husband had died following an automobile accident five weeks previously. She had had much digestive difficulty since her early teens. This had resulted in two cholecystotomies and finally a cholecystectomy at the Mayo Clinic seven years previously. After this operation, she had no digestive disturbances except a tendency to constipation. She had had one attack of eclampsia terminated by a surgical abortion. A tubal pregnancy operation had antedated her onset of diabetes by six months. Sugar had been discovered in her urine in 1932, within a short time after the development of all the cardinal symptoms of diabetes. She immediately went to a large diabetic clinic for a month, during which time she was thoroughly instructed concerning her diet and the use of insulin. She stated that she had responded rapidly and her only difficulty had been mild insulin reactions, which even changing the time and dosage of insulin had not completely eradicated. After returning home, she had more and more insulin reactions and on two occasions she had become unconscious so that she had to be taken to a hospital for treatment. Following this, she had become careless about her diet and had eaten more food, though she had continued her insulin. In spite of this, she had occasional reactions, consisting of hunger, weakness, and at times, sweating. She had developed a marked fear of insulin. She had missed two periods during the year; and because of palpitation and hot and cold flashes during this time, she thought her menopause was approaching. Her physical examination at this time was essentially negative. Her blood pressure was 124/80. Her heart was of normal size and shape under the fluoroscope and no abnormalities could be detected. Her urinary sugar was four plus and her blood sugar was 195 mgms. per 100 cc. Her blood Wassermann was negative. She was put on ambulatory treatment, and a weighed diet containing carbohydrate 73, protein 53, and fat 185 was prescribed. Ten units of insulin were given before breakfast. On this she quickly became sugar-free although the insulin was increased to ten units before each meal. She had a mild reaction during one night and took sugar. The insulin was reduced to ten units before breakfast and supper and no more reactions developed. After a month, her diet had been somewhat increased and she was discharged sugar-free with a fasting blood sugar of 120 mgms. per 100 cc.

She did not report to me again until April 10, 1937. During these two years, she had on one occasion developed a diabetic coma at a quack sanitarium where she had been advised to discontinue insulin "because of its danger." After she had been revived by insulin when her relatives had her removed from this institution, she again resumed her diet and insulin. However, her insulin reactions, she stated, became more and more frequent and severe so that sugar and orange juice no longer relieved them. On one occasion, she had to be taken to a hospital and had to remain for two days. At this time, she had a severe pain in her left jaw for a number of hours, and was afraid she would surely die. She was assured that she would not die from these reactions if she would always take sugar. Several doctors saw her with these reactions and all blamed the insulin.

At midnight April 10, 1937, after taking ten units of insulin after dinner, a reaction characterized by marked weakness, sweating, pain in the left jaw, and fear of death, awoke her. She took two glasses of orange juice and sugar, but failed to obtain relief. When I arrived at two a. m., she was very restless and in a state of marked shock. Her blood pressure was 100/60 and she was having precordial distress as well as pain in the jaw. It was plain at once that she was having a coronary attack. Morphine in huge doses, whiskey, and aminophylline relieved her after two hours. Her urine contained small amounts of sugar during this time. Her condition was so critical that it seemed inadvisable to move her to the hospital. The next day she felt well and, in spite of orders to the contrary, she sat up in bed to drink a glass of water. She suddenly died during this exertion.

Autopsy revealed the pericardial sac to be greatly distended and filled with blood. The anterior surface of the heart contained a moderate amount of fat, but was otherwise normal in appearance. In the posterior wall of the left ventricle, at a point about one-third the distance from the apex to the base, was a clot-filled area, 2.5 cms. in diameter (Fig. 1). The heart itself was only very slightly enlarged, weighing 382 gms. (average maximum 365 grams for her age²). On section, the various valves were normal in appearance and relative dimensions. The right auricle and ventricle were of normal thickness and appearance. The aorta revealed only very slight fatty intimal thickening. The coronary orifices were both patent and the coronary arteries could be well followed to their peripheral branches. There was no abnormal appearance anywhere except in the descending portion of the left coronary artery (circumflex branch). This descending portion, however, was greatly thickened from a point shortly below the base of the ventricle for a distance of 2.5 cms. and completely occluded for a distance of one cm. This markedly occluded area contained a recent organized thrombus seen well grossly and demonstrated by microscopic sections. (Fig. 2). The ventricular wall supplied by this vessel was made up almost entirely by scar tissue and markedly thinned at the point of rupture. The blood clot in the ventricle

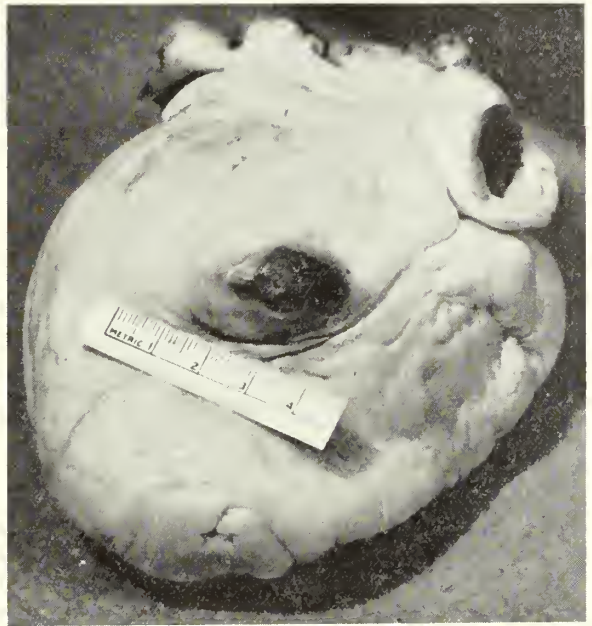


Fig. 1

wall measured about three centimeters in diameter. Microscopically, the left ventricular wall was made up of fibrous tissue. The areas adjacent to the scarring contained many fragmented muscle fibers. The right ventricle and uninvolved left ventricle presented normal microscopic appearance. The arteries in the remainder of the body did not reveal any unusual thickening. There were no other noteworthy findings present at the autopsy.

Comment

The unusual feature of this case was the marked localized occlusion of a branch of the coronary severe enough to produce repeated infarctions and finally thrombosis and rupture of the left ventricle. Of course this sequence of events is common enough,³ although Lewis⁴ states that ventricular fibrillation is the more common terminal condition. The patient was only thirty-five and a diabetic of five years duration, who supposedly understood her condition and treatment better than the average diabetic. Rupture of the heart is fairly frequent at this age, too.³ The fact that this patient had frequent insulin reactions was confusing to her various physicians. Too often she had these reactions while alone at her home. Some of these, no doubt, were true reactions. The coronary feature of some of them would have been detected during the last year if she had been in a hospital, or seen during a severe attack. On at least one occasion, though, she was observed in a small hospital and the diagnosis missed, even though she had pain in her left jaw, precordial tightness, and fear of death. In her small town, no electrocardiographic tracings were available. We had planned to take tracings the day of her death. The extensive pathology found at the autopsy makes it certain that the electrocardiograph would have early prevented confusing the so-called

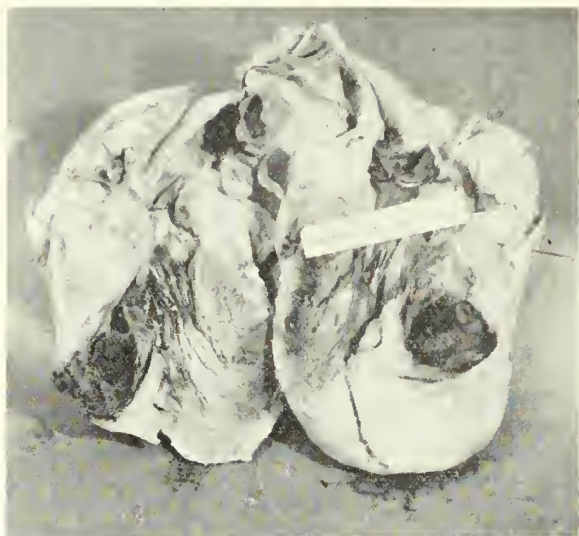


Fig. 2

insulin reactions with the advanced coronary disease present. The most important phase of her diabetic condition would not then have been missed. It would probably be wise to routinely make electrocardiographic studies in all diabetics having such unobserved reactions.

Perhaps hypoglycemia had some influence in producing her coronary attacks. In fact, each attack may have begun as an insulin reaction. It is quite well-established at least that both hypoglycemia and diabetic coma are factors in the production of arteriosclerosis and that the former has produced or initiated fatal coronary

thrombosis.^{5,6} In this case it is doubtful that insulin reaction took place in the final episode as sugar was present in the urine in small quantities at the onset.

Conclusions

1. Symptoms of hypoglycemia from insulin overdosage can closely simulate those of coronary occlusion.
2. Diagnosis of fatal insulin reactions should never be made unless proven by autopsy.
3. Coronary disease is an ever-important complication of diabetes mellitus and can occur even in relatively young individuals.
4. Coronary occlusion, thrombosis, and infarction sometimes terminating in fatal rupture of the heart probably occurs more frequently than is generally recognized in young diabetics.
5. Electrocardiographic studies should be made in all diabetics having frequent and unobserved insulin reactions.
6. Hypoglycemia should be avoided in the treatment of diabetics because of the possibility of producing coronary disease and precipitating attacks of coronary thrombosis.

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The Retroperitoneal Syndrome

Report of a Case

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WE ARE ALL aware of the fact that any disturbance or dysfunction in an organ may give rise to symptoms in other organs which have similar innervation. These phenomena were first described as "viscero-visceral" reflexes by Sir James MacKenzie. A familiar example of such a reflex is the nausea and vomiting which frequently accompanies an acutely inflamed appendix.

Our present knowledge of the retroperitoneal syndrome is based on the clinical observations and experimental studies of Tixier. In 1897, this worker observed that irritation of the parietal peritoneum initiated a series of reflexes culminating in a condition which he described as "abdominal shock" or peritonism. Later it became apparent through clinical investigation that similar reflexes might originate in the kidney and peritoneal tissues. Clavel in 1929 reported an extensive series of

cases of various surgical affections of the kidneys which were accompanied by peritoneal or gastro-intestinal syndromes with no urinary symptoms.

A knowledge of the anatomy and physiology of the upper urinary and gastro-intestinal tracts is necessary in order to understand the reflex mechanism which constitutes the so-called retroperitoneal reflex.

The twelfth dorsal and first lumbar segments of the spinal cord serve as the source of the renal nerve supply. The renal plexus on each side gives each organ its visceral nerve supply. This plexus is derived from the inferior portion of the coeliac plexus, especially from the corresponding aortic renal ganglion which receives: (a) the posterior renal nerve or the third splanchnic derived from the twelfth thoracic ganglion, (b) some fibers from the lesser splanchnic nerve, and (c) a branch from the first lumbar sympathetic ganglion. The kidney

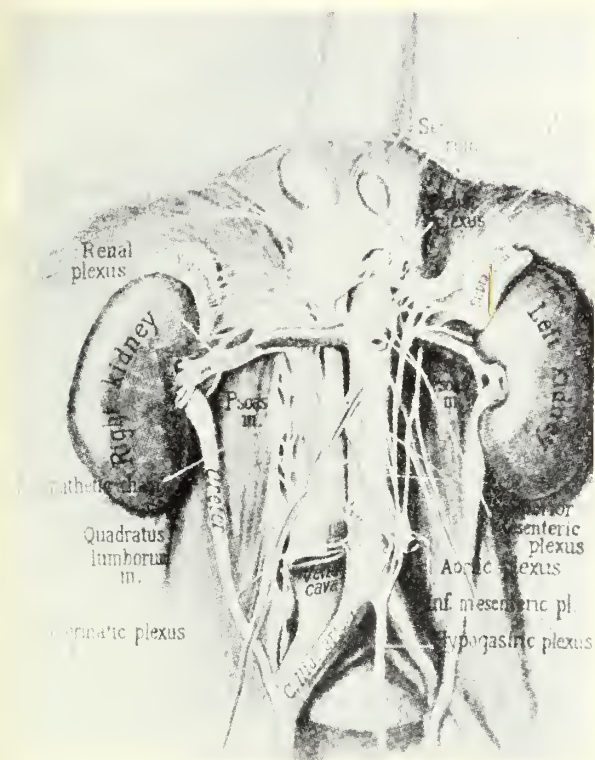


Figure 1. The solar plexus and the nerve supply of the kidneys. (After Labat: Regional Anesthesia).

also receives branches from the vagus nerve whose fibers terminate in the coeliac plexus. (See figure 1.)

The innervation of the stomach, small intestines, caecum and transverse colon is derived in part from the same source as the kidney. These viscera receive their nerve supply from: (1) the vagus nerve which contains parasympathetic (excito-motor) fibers, and (2) coeliac plexus which carries sympathetic (inhibito-motor) fibers coming by way of the greater and lesser splanchnic nerves.

The remainder of the gastro-intestinal tract (descending colon, sigmoid, rectum and anal sphincter) and the lower genito-urinary tract have a common nerve supply consisting of: (a) sympathetic (inhibito-motor) fibers derived from the lumbar segments of the cord, and (b) parasympathetic (excito-motor) fibers originating in the second, third and fourth sacral segments.

The physiological response to stimulation of these various nerves has been accurately determined. When the vagus (parasympathetic) nerve is stimulated, there follows an initial inhibition of the gastro-intestinal movements of very short duration followed by an increase in intestinal peristalsis. Stimulation of the coeliac plexus (sympathetic fibers) results in a slowing or arrest of peristaltic movement. The effect of stimulation of the sympathetic or parasympathetic fibers upon the various sphincters in the gastro-intestinal tract is usually opposite to that effect upon the muscles of the intestinal walls.

The coeliac plexus is said to be the center of reflex action for stimuli originating in the kidney, ureter and

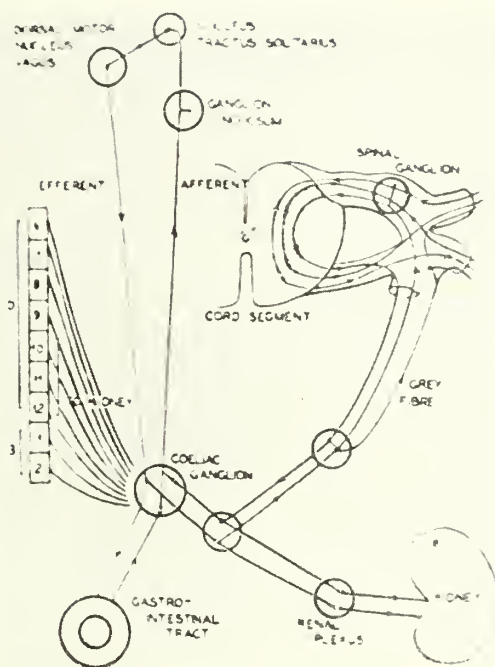


Figure 2. Diagram showing the afferent and efferent routes of renal stimuli. The centrifugal route of the various reno-digestive, visceromotor and viscerosensory reflexes can be readily determined. (After Smith: Canadian Med. Ass. J., 1933; 28:281). After Abeshouse.

posterior parietal peritoneum. Some of these reflexes may be shortened as they pass through the renal ganglia and the inferior mesenteric ganglia, and are referred to the visceral branches supplying the various portions of the gastro-intestinal tract. (See figure 2.) Other reflexes from the kidney and perirenal area take a more devious pathway to reach the spinal cord, passing upward in the tractus solitarius to the nucleus of the vagus. From this point the impulses are relayed through the parasympathetic fibers which are distributed to the stomach and upper intestines, causing a transitory arrest of gastric and intestinal motility followed by an increase in motility. Stimulation of this pathway can produce such symptoms of dyspepsia as pain, nausea, vomiting, heartburn, belching and epigastric fulness. By similar reflex connections through the intermedio-lateral column cells of the spinal cord, impulses are conducted through the sympathetic (inhibito-motor) fibers supplying the large bowel, resulting in abdominal pain, cramps, constipation, diarrhea or ileus.

Case Report

A white male, age 34, while riding horseback, was thrown from his horse, striking his left side against a tree. He was picked up in a state of shock by an army physician, and removed to the hospital by ambulance for treatment.

On examination he presented a pale, ashen facies. Temperature was 98.8, pulse 58; blood pressure was 106 systolic, 56 diastolic. He was quite tender over the left scapula and lower left thorax. There was a marked dis-

coloration seen in the region of the left loin posteriorly. Palpation of the abdomen disclosed a slight rigidity of the left rectus muscle. There was some evidence of free fluid in the abdomen, but distention was absent. Marked tenderness was demonstrable over the crest of the left ilium.

Bedside X-rays revealed fractures of the eleventh and twelfth ribs posteriorly on the left, position good. There was also a transverse fracture of the left scapula extending almost to the glenoid, and a transverse fracture of the left ilium. A catheterized specimen of urine disclosed the presence of many red blood cells. Blood urea was thirty-six milligrams per hundred cubic centimeters of blood. Red blood cells numbered 4,680,000, and white blood cells 14,000.

The patient recovered from shock in two hours, but was unable to void, and complained of severe pain over his left lower chest posteriorly. That afternoon, or approximately five hours following the accident, he started complaining of generalized abdominal cramps. This was later followed by distention which gradually increased along with rigidity of both recti muscles. A high colon enema was given, but the patient was unable to expel the fluid. One-half cc. of pitressin was given subcutaneously. A colon tube was inserted, but no flatus was expelled. His condition remained unchanged, and turpentine stupes were applied to the abdomen, small doses of morphine and atropine being given by hypodermic injection for the relief of pain. The patient was still unable to void next day, and had to be catheterized. Specimens of urine continued to reveal the presence of microscopic blood. His blood pressure was 120 systolic, 78 diastolic. That night the patient had an attack of projectile vomiting. A duodenal tube was passed by mouth and continuous suction applied. Fluids by mouth were discontinued, and he was given 1000 cc. of 5% glucose in normal saline intravenously. The abdominal distention was relieved. Blood pressure was 146 systolic, 70 diastolic, pulse 105, rectal temperature 100.1°. A liter of fluid was removed by duodenal suction in a very short period of time. The abdominal rigidity continued, but the patient's pulse rate never went above 110, and there was no appreciable elevation in temperature.

The surgical consultant did not believe that surgical intervention was necessary, in view of the satisfactory results obtained by duodenal suction. The abdomen was silent on auscultation, and a diagnosis of retroperitoneal syndrome or reno-digestive reflex was made. Treatment was continued by the administration of one cc. of pitressin hypodermically every eight hours. We felt sure now that we were dealing with a case of paralytic ileus and gastric retention. Pain was controlled with morphine, and he was routinely catheterized every eight hours. The duodenal tube functioned well, and four liters of fluid were removed from the duodenum in twenty-four hours. Fluids were given intravenously with small sips of water by mouth the third day, the duodenal tube being clamped off. There was some abdominal distention present, but muscular rigidity began to subside. That night the patient's temperature was 102.8° R., pulse 100.

The fourth day the abdomen was soft, and there was a complete disappearance of tympanites. Peristaltic movements were heard in the abdomen for the first time. The patient was able to void, and the urine showed a considerable decrease in the number of red blood cells. The duodenal tube was removed and fluids were taken by mouth and retained without any obvious signs of gastric retention. He had very little abdominal pain, although with deep breathing he experienced considerable pain over the left lower thorax posteriorly. Pitressin was continued in the dose of one cc. every eight hours for another day. On the seventh hospital day the patient was allowed to be up in a wheel chair. He was placed on a soft diet, and bowel movements became natural. He was dismissed on the tenth day in good condition.

This case is typical of the so-called retroperitoneal syndrome or reno-digestive reflex. Obviously the patient received a renal injury as evidenced by the presence of hematuria. It is believed that gastro-intestinal manifestations accompanying diseases or injuries of the upper urinary tract are far more common than is supposed, and are frequently clinically undiagnosed.

According to Abeshouse, the gastro-intestinal symptoms of the reno-digestive reflex may be classified as: (1) toxic, (2) mechanical, or (3) reflex. The toxic type is usually due to an infectious process in the kidney. Secondly, the gastro-intestinal symptoms may be obstructive in character, as for example, due to the pressure of an enlarged kidney (renal tumor) or extravasated blood or accumulated pus in the perirenal space upon the peritoneum and intestines. In the majority of cases, the gastro-intestinal symptoms are due to reflex phenomena of the stomach and intestines reacting to stimuli originating in the upper urinary tract.

Stimulation of the gastro-intestinal tract by nerve impulses originating in the retro-peritoneal space has been given the name of retro-peritoneal syndrome by Tixier and Clavel. Clinically, these gastro-intestinal manifestations of the reno-digestive reflex may be classified as: (1) gastro-duodenal, (2) biliary, (3) appendiceal, (4) colonic and (5) peritoneal, according to the region which has been stimulated.

This case represents a combination of the gastro-duodenal and peritoneal types. With the gastro-duodenal type, the predominating symptoms are nausea, vomiting and epigastric pain. Generally there is gastric retention present due to a large, dilated, atonic stomach. It is of interest to note the extreme degree of gastric retention which was encountered in this case. The most outstanding clinical findings in this case, however, were the extreme degree of abdominal distention, muscular rigidity, and projectile vomiting, all of which simulated an intestinal obstruction with peritonitis. The latter findings are common to the peritoneal type of reno-digestive reflex. Obviously they simulate a paralytic ileus, and such was presumed when no audible peristalsis could be found in this patient's abdomen.

There are certain symptoms which do facilitate a differential diagnosis between paralytic ileus with peri-

tonitis and reno-digestive reflex. In peritonitis, abdominal distention precedes the onset of pain, whereas with reno-digestive reflex, pain is an early symptom and abdominal distention usually occurs later. One also notices that in apparent ileus associated with injury of the kidney, the general status of the patient is less affected than by a true intestinal obstruction. Fecal vomiting rarely occurs with reno-digestive reflex.

In this case, the condition of the patient did not seem to warrant surgical intervention, and with treatment by duodenal intubation, pitressin subcutaneously, and warm turpentine stupes, the patient was relieved as evidenced by decrease in abdominal distention, softening of the abdomen, and relief from pain with a gradual return of intestinal peristalsis. The daily diminution in the hematuria present was also an indication of recovery from the renal trauma.

This report represents the effect of stimuli of renal origin on the gastro-intestinal tract. It serves to call to

our attention the gastro-intestinal manifestations which can accompany injuries of the kidney. Conservatism in treatment is indicated in such instances, lest the patient be operated upon for a mis-diagnosed intestinal obstruction or peritonitis.

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Bright's Disease

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CLASSIFICATION in Bright's disease is a difficult problem when the physician studies the individual patient. To add to the physician's confusion, the pathologist often presents autopsy facts that are unexpected and disconcerting. Efforts to match the clinical observations with the pathologist's autopsy findings often bring disappointment. To correlate physical examinations, blood findings and urinalyses is a problem that is at times most baffling. We often employ the term *nephritis* as synonymous with Bright's disease. Nephritis signifies inflammation of the kidney. Not all kidney diseases attended by albuminuria are inflammatory.

Perhaps it is best to divide Bright's disease into three main divisions on an anatomical basis. These divisions are represented by the glomeruli, the tubules and the blood vessels. Inflammation of the glomeruli is glomerulonephritis; degeneration of the tubular epithelium produces nephrosis and sclerotic changes of the blood vessels result in the arteriosclerotic kidney. All of these conditions produce albuminuria. Only the first may be called nephritis, if one is careful in terminology.

Bright's disease may be any one of a group of kidney diseases attended with albuminuria.¹ If we accept this definition, we include several kidney diseases that are not usually considered as belonging under the head of Bright's disease, even today, when the term is conveniently elastic.

In 1827, Richard Bright published a book entitled *Reports of Medical Cases Selected with a View of Illus-*

trating the Symptoms and Cure of Diseases by a Reference to Morbid Anatomy.

About that time there was admitted into Guy's Hospital an intemperate sailor whose name was John King. This man was suffering with edema, oliguria and albuminuria. He was attended by Richard Bright. The patient died. An autopsy showed an enlarged heart, ascites, and small granular kidneys.

In a text book² published in 1869, the term *Bright's disease* was applied to two forms of inflammation of the kidney, namely, croupous nephritis or acute Bright's disease, and parenchymatous nephritis, or chronic Bright's disease.

Bright's conception of the pathological changes which take place in a patient ill of the disease which bears his name was remarkably correct, as we understand these changes today. He noted the general course of the disease. He was aware of the rise of retained protein metabolites, the reduction of serum albumin and the lipemia.

He observed the increased blood pressure and the increasing pallor. All of this even though he lacked the aid of blood chemistry and instruments of precision. Disturbances of vision and terminal pericarditis and peritonitis were noted in his description of the disease. Headache, edema, convulsions, oliguria and other signs and symptoms were catalogued in sharp and concise sentences.

Since the days of Bright, much work has been done to clear and confuse the conceptions of physicians rela-

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tive to the structure of the kidneys in their normal and morbid states.

In 1925, a simple classification³ of Bright's disease was employed in the study of a group of patients. This author used three main groups in his classification. They were the hemorrhagic, the degenerative and the arterio-sclerotic groups. This classification is simple and easy to apply to the individual patient.

Bright's disease has become a general term which designates a disease group, the local manifestations being progressive vascular and inflammation changes in the kidneys which are local manifestations of more general pathological processes occurring in the body.

Many attempts have been made to classify Bright's disease into groups upon pathological and clinical bases. Much of this effort has been but to lead to confusion.

A convenient classification⁴ of nephritis is the following:

- | | | |
|---|---|----------------------------------|
| A | { | Large red kidney |
| | | Acute parenchymatous nephritis |
| | | Acute glomerulous nephritis |
| B | { | Large white kidney |
| | | Chronic parenchymatous nephritis |
| | | Chronic nephritis with edema |
| C | { | Small white kidney |
| | | Chronic interstitial nephritis |
| | | Chronic nephritis without edema |

Thus we divide the nephritides into three classes or stages, the "A" stage being the first stage, and so on. The "B" and the "C" stages of this classification have been termed wet and dry Bright's disease respectively.

Possibly we are too prone to regard the several stages of nephritis as separate and distinct entities. This is not true. Within this fact lie some of the difficulties of classification. There may be and surely is overlapping of the stages of Bright's disease. Bright's disease tends to progress. However, it does not always do so. Then again there may be long periods of comparative quiescence in the disease. In other patients, death is brought about by some disease other than kidney disease. It may be pneumonia or what not.

Bright's disease is a clinical entity, but not a pathological one. The most prominent cause is infection. The most common causes of Bright's disease are acute tonsillitis, scarlet fever, rheumatic fever, erysipelas, and subacute bacterial endocarditis.

The next most important etiologic cause is chemical. Mercury bichloride, oxalic acid, carbolic acid and other unusual substances may bring about inflammatory and degenerative conditions of the kidneys.

Vascular causes do not produce true nephritis, but functionally they may produce conditions which are hard to distinguish from the terminal stages of nephritis. Such renal lesions are those associated with arterial hypertension, those caused by lead poisoning, by gout and by senile degeneration.

The real cause of acute glomerulonephritis is unknown. For a long time the association between nephritis and infectious diseases has been recognized. The most reasonable explanation is that the toxins produced by the growth of bacteria in the body bring about the inflammatory changes in the kidneys.

It is possible and even probable that these changes are allergic in nature. It has been found that if streptococci scarlatinae are injected into a rabbit, no effects are produced in its kidneys. However, if the active toxic principle of this organism is used, acute glomerulonephritis is produced.

It is to be noted that streptococci are not found in the glomeruli. This does not prove that they have not been present, but it is suggestive. The acute Bright's disease of scarlet fever makes its appearance during convalescence, not at the time of the acute infection. This may be regarded as a point of argument for the allergy theory in acute glomerulonephritis.

In a recently published text book, the author⁵ gives us a table in which he correlates some of the many classifications of Bright's disease. It is well worth one's careful study. A recent publication⁶ is a report of the pathological study of one hundred and ten patients who were ill of clinical acute nephritis. The requirement for the diagnosis in these patients was definite impairment of renal function as indicated by retention of nitrogenous products, decreased ability to excrete phenolsulphonephthalein, inability to form a concentrated urine, bleeding from the parenchyma of the kidney and severe oliguria or anuria.

The author subdivided the one hundred and ten cases into groups according to structural changes in the kidneys. Of these, fifty-one were classified as acute proliferative glomerulonephritis, twenty of them were associated with other diseases and thirty-one were uncomplicated.

The main structures of the kidney are the nephrons, which include the glomeruli and tubules and the blood vessels. It has been estimated that the nephrons number two million.⁷ It must be that there is an enormous reserve power of function in the kidney. It has been estimated that a kidney may lose seventy-five per cent of its glomeruli and still be able to function. It is probable that only a portion of the total number of glomeruli function at any given time.

It appears that the process of elimination of urine is purely a physical one. Blood is brought into the Malpighian bodies, which are a bundle of capillaries surrounded by Bowman's capsule. This filter has the power of obstructing the passage of large protein molecules, but it does allow the passage of urea, glucose and sodium chloride.

Urea readily passes into the urine; on the other hand, glucose and salt are valuable to the body and held back after a certain threshold for each substance has been reached. It is said that glucose and salt are reabsorbed by the tubules to maintain certain minimal requirements of the body. If the Malpighian tuft is injured, blood

protein is allowed to escape. Albuminuria may also be caused by accretions from the tubules and by blood serum anywhere in the genito-urinary tract.

The physiology of the kidney is not definitely known.⁸ One may accept Ludwig's mechanical theory or Bowman's secretory theory as one wishes at this time. Both these theories have supporters. There are others who support an intermediate theory. There is a large literature relative to this controversial phase of physiology.

Until the physiologists have agreed, the clinician need not be too concerned about the exact mechanism of kidney elimination. He may devote his energies to the application of proven facts in his attempts to obtain relief for those of his patients who suffer from kidney diseases.

Under the head of nephrosis⁹ are included cloudy, swelling, granular degeneration, fatty degeneration, and necrosis of the kidney as viewed by the pathologist. The clinician includes under nephrosis that condition which produces an abundance of albumin in the urine, no elevation in the arterial blood pressure, edema of the tissues of the body and the blood findings of normally maintained elimination of protein metabolites.

There is much difference of opinion as to just what constitutes nephrosis. From the clinicians' standpoint it may be said that one kind of nephrosis may be the second stage of nephritis or nephritis with edema as viewed by the pathologist.

Another author¹⁰ states that the term nephrosis is unfortunate, has been loosely used, and has given rise to much confusion. He states that the most striking positive signs are edema, albuminuria and hypercholesterolemia. He questions that we are justified in calling this complex a separate disease. It is probable that urine and blood findings and clinical signs are all due to the continued loss of albumin in the urine.

The kidney of the toxemia of pregnancy produces urine which contains an abundance of albumin and granular and hyaline casts. The condition is regarded by some as nephrosis. Others regard the condition as due to spasm of the arterioles, which results in degeneration of capillaries in the glomeruli. The final result is the escape of albumin into the urine. Whatever the cause, vascular lesions are of primary importance in pregnancy toxemia.

The pathology of the primary contracted kidney or granular kidney is primarily vascular. It is the kidney of arterial hypertension. There are many gradations, from minute microscopic granulations to those which may be readily seen at autopsy. It is the arteriosclerotic kidney.

This kidney may be of usual size and appearance. It may be increased in size or it may be less than normal size. It may function normally or there may be extensive renal degeneration with resulting malfunction. Ten or fifteen per cent of such patients may be so profoundly and rapidly affected that the condition may

bring about so-called malignant hypertension, soon ending in uremia and death.

The majority of these patients do not suffer so acutely and are said to be ill of essential arterial hypertension. It is to be remembered that the arteriolar changes in the kidney of hypertension is but a local manifestation of a general process of the arterial system.

Persons who are well along in age are prone to the kind of arteriosclerosis known as atheroma. This condition brings about ulcerated and necrotic patches in the large and medium size arteries including the renal arteries. Such patients are likely to have scars and depressions in the kidneys which suggest old infarcts.

The kidneys of such patients are smaller and softer than the granular kidney of hypertension. Many of the glomeruli of these kidneys have been destroyed. This condition is a degenerative one. There is no evidence of renal failure. There is but very little albuminuria and only occasional casts are found in the urine. The blood pressure is not elevated. Many of these patients get along well with their abnormal kidneys for considerable periods of time. Their lives depend upon the fact that there is a large reserve in the kidney. Eventually, such patients are likely to die of heart failure due to myocardial degeneration which may be the deciding condition in atheroma.

A given patient who has albumin in his urine must be carefully examined. There are several steps in the examination. All of them are important. It is difficult to say which one is the most important. Perhaps these steps should be regarded as of equal importance then none of them will be slighted.

These steps may be enumerated as follows:

1. History
2. Physical examination
3. Urine examination
4. Kidney function tests
5. Blood examinations

Our present knowledge¹¹ is insufficient to allow us to completely correlate the anatomical changes in the kidney with their functional disturbances. We have, however, learned to make certain examinations, the results of which help us to determine, relatively, the integrity of the kidneys.

The function of the kidneys is to separate from the blood certain substances which are harmful to the body and excrete them in the urine. At the same time, they must prevent the improper elimination of food products and other vital substances. This is a delicately-balanced mechanism. Were it not that there is a considerable reserve of excretory tissue in the kidneys, they could not withstand so well and so often the onslaught of disease.

In obtaining the history of the patient it is well to go into detail. This is time-consuming. Every practicing physician knows that the patient or his family notes only the symptoms of pain and discomfort. How long has

the patient been ill? Has he suffered with an acute illness? Has he lost or gained weight? Has he suffered from disturbances of urinary function? These are but a few of the questions to which the careful physician must obtain answers.

The physical examination must include the entire body. Many hidden defects are often disclosed by this procedure. Pallor, edema, dyspnea, eye ground changes, heart outline, sounds and rhythm, arterial blood pressure, and lung fields are thought of, and any abnormalities carefully evaluated.

Albumin in the urine indicates either a simple mixture of albuminous matter, such as blood, with the urine or a morbid state of the kidneys, permitting albumin to pass from the blood.

Heller's cold nitric acid must be made with urine which is acid in reaction. The urine must not be too concentrated. Aromatic oils such as santal oil, balsam of copaiba, or balsam of tolu, may give a false reaction. The heat test may produce errors. The urine must be absolutely clear and acid to litmus paper.

The quantitative estimates of the amount of albumin in the urine are of little help in evaluating the status of the patient. If albumin is found in the urine it is to be regarded as an indication of a destructive lesion somewhere in the genito-urinary tract.

The most useful examination of urine is that made by the use of the microscope. Casts are an index of degeneration changes in the kidney. Many casts mean much, and few casts mean little, destructive changes going on in the kidney. Cylindroids are of little importance except as they may be mistaken for casts. Leucocytes in the urine indicate that the kidney changes are inflammatory in nature.

Red blood cells in the urine mean that blood vessels have ruptured or that diapedesis has occurred. Epithelial cells are difficult to identify, because they lose their nuclei and swell and shrink with the variations of salt concentration and acidity of the urine. Contaminations with vaginal and urethral cells and pus further complicate the examination.

The renal function tests fall into two main groups. The first are tests of ability to excrete water and to concentrate normal products of excretion. The second is made up of tests for the elimination of foreign substances. The simplest tests of kidney function are those of Mosenthal and Volhard. Neither is very time-consuming, and the technic can be easily mastered by the nurse. The principle upon which these tests are based is the fact that in failure of renal function, there is inability to concentrate or to dilute the urine.

The urea concentration and clearance tests have been well worked-out and standardized. Urea, being a normal constituent of the urine, has been made use of as an index of the ability of the kidney to eliminate. Tests employing this principle require the help of a laboratory technician. The technic requires the examination of both blood and urine.

In the tests employing foreign substances, the best-known and most valuable is the "P.S.P." or phenol-sulphonphthalein test. In this test, one cubic centimeter of a solution containing six milligrams of the dye to the cubic centimeter is given intramuscularly, and the urine is collected twice thereafter. The first is taken at the end of one hour and ten minutes, and the second an hour later. These two specimens of urine are examined in the laboratory for dye content. When sixty to eighty-five per cent of the dye which was given to the patient is found in the combined specimens of urine, the kidneys are said to be functioning normally.

In the examination of the blood of a patient who has albumin in his urine, the first step should be the enumeration of the erythrocytes and the leucocytes. The hemoglobin content should be determined and the differential leucocyte count recorded.

The blood Wassermann should be obtained in all cases. The Kahn flocculation test is trustworthy. It may be used with satisfaction in small laboratories, for it is less time-consuming¹² and less likely to lead to error than the more difficult Wassermann technic.

The substances which are normally in the blood and normally excreted in the urine are used as indices of renal function. The most important of these substances in diagnosis are the nonprotein nitrogenous constituents of the blood.

Urea, uric acid, creatinine, and creatine are usually the substances considered in the examination of a patient ill of kidney disease. For practical purposes one needs to consider only urea nitrogen, creatine and creatinine.

The normal¹³ for the above substances in blood taken from a patient after an all night fast are: urea N. 12 to 15, creatine 3 to 7, and creatinine 1 to 2. The figures all represent milligrams per one hundred cubic centimeters of blood.

All the above substances are waste products. There are others, but these are ones that can be readily determined in a fairly modest laboratory. They can be used as indicators of kidney function with assurance that the results of the tests will not be grossly misleading.

Urea is formed solely in the liver in the dog. It is a product of nitrogenous metabolism. There is a relatively constant level of the substance in the blood of the normal fasting human being. It varies widely in sick people.

It is in patients suffering with kidney disease that the deviation of blood urea nitrogen is particularly noted. In terminal nephritis of the dry variety and in bichloride of mercury poisoning, figures of two hundred and fifty milligrams of urea nitrogen per one hundred cubic centimeters of blood are often obtained.

A number of other diseases also give increased figures for urea nitrogen. Among these diseases are general carcinosis, syphilis, pneumonia and peptic ulcer. However, the figures in these diseases show only moderate increases from the normal and do not detract from the importance of the test in nephritis.

The substances creatine and creatinine are very interesting. The origin of creatine is highly speculative; creatinine is said to be due to muscle metabolism. It is probable that creatine is exogenous in origin, and that creatinine is endogenous in origin.

Both these substances have complex molecules. They are readily transformed into one another in alkaline media. They are both relatively of constant level in the blood. Blood creatinine is a good basis for prognosis. Five milligrams per one hundred cubic centimeters of blood frequently indicates early death of the patient.

A practical test for blood urea was described several years ago. In 1853, Liebig¹⁴ made use of the power of mercury to combine with nitrogenous products for the determination of urea in the urine.

In 1923, a mercury titration method¹⁵ for the determination of urea in saliva was developed. In 1926, a similar method¹⁶ was applied to the blood. The method is based on the fact that mercury will combine with such products as urea, creatinine and uric acid.

In this test, five cubic centimeters of oxalated blood are added drop by drop to five cubic centimeters of ten per cent trichloroacetic acid. This coagulates the proteins from the blood. The filtrate contains the non-protein nitrogenous constituents of the blood.

Five per cent solution of mercuric acid is added from a burette to five cubic centimeters of the filtrate until a drop from the unknown added to a drop of saturated solution of sodium carbonate on a white plate gives a reddish brown precipitate which indicates the end result. From this procedure is calculated the number of cubic centimeters of five per cent solution of mercuric chloride that will combine with one hundred cubic centimeters of deproteinized blood. The normal is 70 to 100. Greater values indicate the abnormal retention of urea in the blood.

The method is not to be considered as replacing blood urea determinations by the use of urease, but it is applicable in small laboratories where time and dearth of apparatus are factors. The test can be performed by the technician in fifteen minutes. It is sufficiently accurate for clinical use.

Renal rickets, amyloid disease of the kidney, orthostatic albuminuria and congenital polycystic kidney are merely mentioned in passing. While they do not belong under the head of this paper, they all present one or more of the symptoms, physical and laboratory findings of Bright's disease.

It may be said in conclusion that classification in Bright's disease is unsatisfactory at the present time. The procedures in the diagnosis of kidney diseases are well-known and well-grounded. With a small laboratory, modestly equipped, in which may be performed relatively simple tests, the physician may give his patients who are ill with kidney disease as good service as can be given them anywhere.

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The Treatment of Pernicious Anemia

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THIS PAPER will deal with the treatment of pernicious anemia. Pernicious anemia may be defined as a grave, progressive anemia interrupted by remissions and occurring without any discoverable cause. It is characterized by certain changes in the blood and blood-forming organs, in the central nervous system and in the gastro-intestinal tract. This disorder usually occurs in middle life, but a few cases begin in the third decade. It does not occur in childhood and is rare in individuals more than sixty years of age. Males predominate. Little is known about its geographical distribution except that it is widespread in the white race, particularly among people of Nordic origin. It has been observed in the mulatto Negro.

Before the advent of liver therapy, the treatment of pernicious anemia was a matter of guess work. Transfusions seemed to be the basis of all treatment and it appeared that in some cases they were beneficial and caused remissions, but in many of the cases after several remissions, transfusions had little, if any, effect.

The credit for success in the treatment of pernicious anemia must be given to Minot and Murphy¹⁸ who proved that adequate liver feeding will maintain remissions, thereby laying the foundation for the successful results that have been obtained.

One should follow a definite course in the treatment of pernicious anemia and should base the success of the treatment upon the reticulocyte response. Castle and Taylor⁴ obtained the maximum reticulocyte response by giving daily injections of extract obtained from fifteen to twenty grams of liver. A similar response would be obtained orally, if fifty to seventy times as much liver were used. This is probably due to the fact that liver is poorly utilized or partially destroyed in the gastro-intestinal tract. In many cases there had been no response by giving liver extract orally, and when much smaller amounts were used parenterally, the results were excellent.

Dr. Theodore Klumpp¹⁴ of New Haven, Connecticut, claims that autolyzed liver concentrate is effective in maintaining remissions in pernicious anemia. As a result of this work, autolyzed liver extract was commercially developed. It is claimed that this material is much more potent than conventional liver extract and contains the same amount of liver—150 to 200 grams. The dose varies from one teaspoonful to one ounce, the average dose being three teaspoonfuls.

However, Castle and Strauss²⁶ could not duplicate his results, and state that experimental and commercial autolysis of liver made according to Herron and McElroy have less hematopoietic activity in the treatment

of pernicious anemia than the amounts of liver from which they are derived. Other investigators supported his view and contend that autolyzed liver extract has no advantage over ordinary liver extract.

Dr. Greenspon⁹ has shown that autolyzing the gastric mucosa with hydrochloric acid or autolyzing the normal gastric juice is effective in the treatment of pernicious anemia.

Gibson and Howard,⁷ in an article many years ago before the advent of definite liver therapy, stated that a diet rich in iron and containing considerable amounts of liver established a positive nitrogen and iron balance and appeared to increase the frequency of remissions in pernicious anemia.

In some experimental work conducted by Minot, Murphy and Stetson¹⁹ approximately one-half pound of cooked liver or kidney was administered daily to individuals ill with pernicious anemia. This was followed by a marked rise in the blood count. There was definite, but much slower, improvement in the spinal cord symptoms and a disappearance of the sore tongue and diarrhea. There was no return of the gastric symptoms. Patients showing severe cord symptoms were rapidly transformed from a state of invalidism to practically unimpaired health and strength. A sense of well-being often appears within a day after the administration of large doses of liver extract. The changes in the blood picture are the most striking. By the fourth day after starting liver feedings the reticulocytes, usually less than two per cent before treatment, increased sharply and reached the peak between the seventh and tenth days, the height of which is inversely proportional to the initial red cell count. With a red cell level of 1,000,000, a reticulocyte peak of 40 per cent or more may follow; with 2,000,000 red cells, the peak may be 20 per cent; with 3,500,000, the peak 8 per cent; while initial red counts over 3,500,000 are not followed by any significant rise in the reticulocytes. Within three weeks after the initiation of the therapy, the reticulocyte count again sinks to normal level. The red blood count and hemoglobin usually begin to rise shortly after the reticulocyte peak and continue to rise until approximately normal levels are obtained, within one to two months. The color index also tends to return to one or less and although poikilocytosis disappears, examination of the blood smears reveals the presence of a few macrocytes. The white blood count and the platelet count also return to normal. It may be of interest to note that during the first week of therapy there may be a transitory occurrence of a few myelocytes. Occasionally, patients on a liver diet develop a marked eosinophilia⁸ which has not been noted when stomach preparations or partially purified injections of liver extract are used.

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Peabody²¹ trephined the tibia and obtained bone marrow at various stages of the disease. When the blood count is low, there is marked hyperplasia and the fatty marrow of the long bones is largely replaced by red marrow which is characterized microscopically by the accumulation of large numbers of megalocytes. As the peripheral blood picture improved, the hyperplastic marrow returned to the normal type with the disappearance of the megaloblasts. With the treatment by the active liver material, the megaloblasts matured and reached the peripheral circulation first as reticulocytes and later as normal adult blood cells.

Reynolds and Sturgis²² have noted that during the reticulocyte rise there is a sharp increase in the urinary excretion of uric acid, probably due to the increase of the disintegrating red blood cells.

Farquharson, Borsook and Goulding⁵ state that the increased excretion of urobilin in the stool and urine and the elevation of blood pigment in serum may all be interpreted as evidence of an active hemolytic process. All return to normal following adequate liver therapy.

In an article on cholesterol metabolism, Dr. E. Muller²⁰ showed that the lowered serum protein and the cholesterol values, also, assumed their normal level. Therefore, it seems that when adequate liver therapy is employed, the abnormalities that have been observed in the morphology and chemistry of the blood disappear with the exception of a slight tendency to macrocytosis.

The changes which take place in the nervous system must be judged by the clinical course. Collier, in *Oxford Medicine*, states that the essential lesion is a myelin degeneration affecting chiefly the dorsal column, the pyramidal tracts of the spinal cord, and to a lesser extent the white matter of the brain and the peripheral nervous system.

Baker, Bordley and Longcope together with Minor, Castle and Ungley^{1,17,24} claim that by adequate administration of liver to patients showing signs and symptoms indicating spinal cord involvement, they were able to arrest the progress of the lesion so that gradual improvement takes place over a period of months or even years.

Dr. Fried⁶ states that the most important point in the treatment of cases with spinal cord involvement is to maintain the blood at or above normal level. Even when the red blood count is as high as 4,000,000, the development of cord lesions has been observed, while with red blood cells of 5,000,000 or better, this has not taken place. In the most severe cases, even those presenting bed sores, paralysis and bladder involvement, there may be response under adequate liver therapy. The rate of improvement of the spinal cord symptoms is inversely proportional to their duration, the outlook for complete recovery being much brighter, if the symptoms have been present for only a few months. Even those of several or many years duration may show improvement with prolonged intensive treatment. The response of the gastrointestinal tract to liver therapy is of great interest. The

sore tongue rapidly improves and the papillary atrophy of that organ may gradually become less. The diarrhea that is inclined to be present usually disappears. The central lesion of pernicious anemia which is the achlorhydria, however, persists.

Drs. Levin and Lang¹⁶ have shown that achlorhydria is practically always present in classic Addison's anemia and may exist for many years before the onset of the involvement of the blood or nervous system. There may be a rare exception in that the acidity of the gastric tract may recur, but the usual case is that it persists even after the liver therapy has brought about a return of the blood and marrow to normal and favorably affected the nervous system.

Dr. Castle,³ in an article on the relationship of chronic gastric atrophy to pernicious anemia, states that gastric atrophy does appear to be the most constant feature of the disease. He also notes that following gastrectomy in man, the development of pernicious anemia is not as constant as one would think. The disease as yet has not been produced in animals by this method. Even as important as gastric atrophy is, then, there may be additional factors responsible for the inability to synthesize the material in the body which is necessary for the development of the disease. It is also known that the disease is very rare under the age of thirty, so this may be due to the rarity of gastric atrophy in the young. By the injection of sufficient amounts of liver at one to three week intervals, the disease may be controlled, and when the injection treatment was intensive, certain refractory cases and those with involvement of the central nervous system were markedly improved. The question concerned with the administration of the liver extract in adequate dosage is very perplexing. The only reliable method of standardization has been the reticulocyte response in an untreated case of pernicious anemia to a submaximal dose of liver extract. The response of different cases has rendered standardization difficult.

Therefore, the Council on Pharmacy and Chemistry of the American Medical Association, in 1935, reported²⁵ on the evidence that would be necessary to make the preparation acceptable. Evidence has proven that 200 to 400 grams of fresh liver, 30 to 40 grams of desiccated stomach, combinations of liver and stomach, or extracts for parenteral administration obtained from 10 to 15 grams of liver will induce and maintain remission in pernicious anemia. Standardization of preparations must depend on the reticulocyte response. The test patient should be normal except for his anemia, the blood count between 1,000,000 and 3,000,000 per cubic centimeter, the patient should not be in a spontaneous remission, have had a blood transfusion recently, nor been on anti-anemic material within a month. Daily reticulocyte counts are made for ten days. The minimum reticulocyte count is 30 per cent for 1,000,000 red blood cells per cubic centimeter, 18 per cent for 1,500,000, 12 per cent for 2,000,000, 7 per cent for 2,500,000 and 4 per cent for 3,000,000. The extract should be tried on three patients.

The suggestions for labels would be that "The daily oral administration of . . . Gm. of the material prepared by the method employed in producing the contents of this bottle (or vial) has been demonstrated to produce satisfactory hematopoietic response in pernicious anemia according to standards of the Council on Pharmacy and Chemistry; or the daily parenteral injection of . . . cc. of the contents of these ampules containing material which has been demonstrated to produce satisfactory hematopoietic response in pernicious anemia according to standards of the Council on Pharmacy and Chemistry."

Bethell¹² has pointed out that the total reticulocyte reduction is probably more important in standardizing extracts than is the reticulocyte percentage on any given day. The statement that a given volume of extract is derived from a given weight of liver may be misleading as loss in potency occurs in manufacture and it is, therefore, best for the clinician to treat each case individually, adapting the dosage to the needs of the patient.

The initiation of remissions and the attainment of normal blood values are comparatively simple. After that, the proper amount of extract can be given in sufficiently frequent intervals to maintain the red blood cells above the normal level. This is imperative in patients with spinal cord involvement. These should be given amounts of parenteral extract daily that will normally maintain a patient without cord involvement for an interval of two to three weeks. Most of the commercial extracts are prepared so that an injection of one to ten cubic centimeters will be followed by a maximum reticulocyte response and a similar amount injected every one to three weeks will maintain the average case. In general, all patients with cord lesions, particularly those with marked arteriosclerosis, require larger doses.

Isaacs, Sturgis, Goldhamer and Bethell¹³ use liver extract intravenously, but caution that it should be injected very slowly because occasionally very severe reaction follows. It is much better to use the intramuscular route, unless it is absolutely necessary to give large doses. A few severe reactions may follow even intramuscular injections, characterized by urticaria, fall in blood pressure, vomiting and increased intestinal peristalsis. These symptoms are usually due to idiosyncrasies of the patient rather than to impure preparations, because they have been observed with highly purified material. Allergic individuals especially should be treated with caution. When starting treatment with liver extract, it is wise to give the patient a small dose at first to determine if there is idiosyncrasy and then follow in two or three hours, or longer, with the usual dose. It must be borne in mind that in pernicious anemia additional vitamin deficiency may occur and it is advisable to give vitamins in conjunction with liver. Iron in many cases may be superfluous, but in certain instances it is necessary in order to maintain normal hemoglobin values. Usually, iron in doses equivalent to about ten grains of iron ammonium citrate three times a day will suffice. In many cases much smaller doses may be given.

Sturgis and Isaacs²³ have found that the administration to patients of powdered hog stomach filtered and desiccated at low temperature was of definite benefit in the treatment of pernicious anemia, thus establishing the rôle of the stomach in the causation of pernicious anemia. The daily administration was from twenty to thirty grams of desiccated material which was obtained from 150 to 200 grams of fresh stomach. This is manufactured under the trade name of ventriculin. The feeding of ventriculin was followed by response analagous to those already described from liver feeding, and all the effects obtainable by the oral administration of liver and liver extract were obtained. All activity of stomach preparations was lost by heating one hour at seventy degrees centigrade and desiccation must be carried out below forty-five degrees centigrade. The material must not be heated before administration to the patient.

Many of the proprietary houses have stated that their ampule of liver contains the extract of a certain amount of raw liver. This is not very reliable because, although one cubic centimeter of the injectable liver may have been derived from 100 grams of raw liver, it is known that during the preparation it may lose 35 to 50 per cent of its potency. One should judge the effectiveness of liver dosage by the results obtained. Not until manufacturers furnish the maximum reticulocyte response that is obtained from each cubic centimeter of liver injected can one rely upon the dosage suggested. At present there are on the market almost as many injectable forms of liver extracts as there are manufacturers. One should not become enthusiastic in recommending any liver preparation until one has had the experience in obtaining results and then judging how much liver is necessary to produce a remission and return the patient to his normal condition.

Hahn¹¹ has held that if patients with pernicious anemia are treated intensively before operation and during the postoperative period, they will tolerate surgical operations very well. This statement is based on his experience with thirty-two cases of pernicious anemia which were operated upon.

The experimental work of Helmer, Fouts and Zerfas¹² has shown that 50 cc. of normal gastric juice was the minimal amount necessary to combine with one vial of Lilly's liver extract to produce the reticulocyte count. On the basis of their work, Lilly has produced extralin, which is a combination of normal gastric juice and liver with yeast. They believe that vitamin B₂ is also an essential factor in the treatment of pernicious anemia. They suggest that the dosage vary from nine capsules daily to six, but a satisfactory maintenance dose must be determined by the response of the patient.

Drs. Lassen¹⁵ have treated eight patients with typical pernicious anemia with various yeast preparations and have come to the conclusion that yeast appears to be either completely without any anti-anemic effect, or contains a minimal amount of anti-anemic factor.

Grinker and Kandel¹⁰ claim that liver therapy is not efficacious in improving or preventing degeneration in the

TABLE No. I
Results of Treatment with Liver or Other Preparations

Hemoglobin % at Examination	Number of Cases						Number of Cases Not Heard From
	Parenterally			Orally			
	Fair	Good	Excellent	Fair	Good	Excellent	
10—20				1			2
21—30	1			3	1	1	2
31—40		4		2	2	3	2
41—50		3		1	2		
51—60	1	2					4
61—70		1		2	2	1	5
71—80					2		2
81—90			1			1	1

central nervous system complicating pernicious anemia. By increasing the number of red blood cells in the circulating blood, liver improves the general strength of the patient and thus exerts a beneficial effect on combined degeneration of the cord. Therefore, weakness may closely imitate the effect of the damage to the spinal cord. Liver cures the mental symptoms of pernicious anemia which are usually caused by anemia. Peripheral nerve complications of the disease consisting of trophic changes in the skin and other associated defects are alleviated by the recession of the anemia. These complications are much more frequent than they are believed to be. The majority of the cases of combined degeneration of the cord develop rapidly at the onset and then progress slowly, no matter what therapy is employed. This gradual progression may be falsely interpreted as signifying improvement. Combined degeneration of the cord develops not infrequently before the anemia and should be diagnosed by the character of the cord syndrome, achlorhydria, glossitis and blood smears.

Liver therapy and pernicious anemia should be controlled by the height of the blood count. Quantities of liver in excess of that necessary to maintain a normal blood level are wasted. Although many observers claim that there is a definite improvement in the nervous system, one cannot say that there has been recession of the damage done to the nervous system because there is no accurate method of measuring this damage. When treating a patient with central nervous involvement one must not be over-enthusiastic in promising freedom from further nervous symptoms or progression of the lesion, because many cases of central nervous system damage have progressed even when adequate dosage of liver has been given and blood counts have been maintained at normal levels.

Strauss and Solomon's work,²⁷ however, reports that twenty-six patients with cord changes on adequate parenteral liver extract showed an arrest of neural lesions and eighty cases without cord changes did not develop them.

It is advisable to give liver parenterally whenever possible, because it is cheaper; the patient will agree to intensive treatment for several weeks, knowing that it may be possible to limit administration to one injection weekly or monthly, depending upon the response to the treatment. The amount given depends upon the severity of the disease. As much as 10 cc. of liver extract may be given daily. Transfusions may be advisable when the patient is in a critical condition, in order to tide him over until the liver extract has taken effect. Iron may be advisable to supply sufficient hemoglobin for the increase in red blood cells. Yeast may be added, but it is not essential. The diet may at first require considerable attention, but as the patient's condition improves, he will usually eat sufficiently to supply all necessary vitamins and mineral needed. Dilute hydrochloric acid may be given, if gastric symptoms persist, but as the blood picture approaches normal, the patient will automatically discontinue its use without the return of gastric distress.

When a person cannot take liver parenterally, liver extract and stomach preparations may be given by mouth, but the patient must be watched carefully to see that sufficient amounts are taken and that the patient does not discontinue their use, either from monotony or expense.

It has also been stated by the majority of investigators that liver extract intramuscularly will maintain remissions, improve the nervous symptoms, and prevent progress of the disease, providing that the red blood count is maintained above 5,000,000 cells. The patient should have a monthly check-up to avoid relapses and during infections should be watched as carefully as a diabetic patient, because even on an apparent maintenance dose of liver, relapses may occur.

The following analysis, covering a ten year period, is based upon a study of 84 cases of pernicious anemia. An attempt was made to follow-up the entire series, but you will note in Table No. I that there were eighteen patients on whom we were unable to obtain follow-up

TABLE No. II
Analysis of Deaths—Considering Treatment Given

Hemoglobin % at Examination	Liver & Stomach Preparations		Iron Preparations Only	Blood Transfusion Only	No Treatment	Duration Symptoms	Treatment Continuous	Time from 1st Exam. Until Death
	Parenteral	Oral						
10—20		1		1		1½—4 months	Yes - 2	1 week
21—30	1	3				2 wks.— 3 yrs.	Yes - 4	1—3 months
31—40	1	2	1			9 mo.— 8 yrs.	No - 2 ? - 2	3—15 years
41—50	2	2			1	5 mo.— 3 yrs.	No - 5	1 day— 2½ yrs.
51—60	1	3	1	1		6 wks.— 10 yrs.	Yes - 3 No - 3	2 mo.— 6 yrs.
61—70		3	1			6 mo.— 5 yrs.	No - 1 Yes - 3	1½—4 years
71—80		1	2			2 yrs.	Yes - 1 ? - 2	3—8 months
Unknown		1				1 yr.	No - 1	3 mo.

information. The results of the treatment of 37 patients, as shown either by subsequent examinations or by letters from the patients, are given in Table No. I. Table No. II covers an analysis of the 29 deaths. Eleven of these patients had complications which are listed in Table No. III.

TABLE No. III
Complications in the Fatal Cases

Hypertensive Heart Disease	1
Colitis Ulcerative Acute & Subacute Combined Sclerosis	1
Lobar Pneumonia and Subacute Combined Sclerosis	1
Chronic Uremia and Subacute Combined Sclerosis	1
Subacute Combined Sclerosis	5
Surgical:	
Appendicitis Acute with Peritonitis	1
Duodenal Ulcer and Cholecystitis	1

In conclusion, pernicious anemia before the advent of liver therapy had been considered a grave and hopeless disease, but now one may prolong the life of a patient for many years by giving him the benefit of liver therapy. Liver extract parenterally is the most satisfactory because of the ease of continued and adequate administration, and because its use is economical. Most of the failures of the present treatment in cases of pernicious anemia may be attributed to lack of coöperation or ignorance of the patient, rather than to inefficiency of liver therapy.

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A Case of Malaria Developing in North Dakota

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THAT malaria is characterized by paroxysms of intermittent chills and fever is, of course, well known, but in analysis of a clinical case occurring in the north central states and presenting such a syndrome, the possibility of malaria might be dismissed without adequate investigation.

Weir¹ has recently reported a case of malaria which developed in Minnesota. It was thought worthwhile to report a case developing in North Dakota.

Case No. 66425-A, J. M., Mott, North Dakota, married, male, age 45, American nativity. He was seen for the first time on October 13, 1936. His family and past history showed nothing of significance except that he had had severe influenza with pneumonia in 1919, from which he recovered completely. The patient was born and reared in the northern part of South Dakota and moved to North Dakota in the fall of 1934. He had never been out of either state until August 13, 1936, when he was on an automobile trip with his family, visiting the western parks and the Pacific Coast states. He returned to his home at Mott, North Dakota, on September 1, 1936.

His first symptom consisted of a feeling of weakness, beginning on September 2, 1936, and this symptom gradually increased in severity until on September 15 he had a definite chill, lasting several minutes. He felt quite prostrated after this, but there was no further chill and no fever to his knowledge until September 22, when he had another chill lasting several minutes. He was confined to bed. The party who accompanied him on the automobile trip remained in good health. On October 6, 1936, he had another chill and the temperature at that time rose to 104.5 degrees. The appetite was impaired and there was considerable constipation relieved by enemas. The patient had lost in weight from 200 pounds to 179 pounds.

First examination at the Clinic revealed a fairly well-developed, adult male, showing some evidence of weight loss. The temperature was 98.8, pulse 90 and respiration 20. The blood pressure was 135/80. Complete physical examination revealed no definite abnormalities. A single urine specimen showed albumin +, sugar 0, bile 0; on microscopic examination a few pus cells were noted. He was seen on the morning of October 14, 1936, at which time the temperature was 100.4 degrees and the white blood count 7,800. Urine examination at that time showed albumin +, sugar 0, red blood cells +, and occasional pus cells. Hospitalization was then advised, but the patient could not remain and he returned to his home.

Agglutination tests for typhoid and paratyphoid fever, undulant fever and tularemia were negative, as well as

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the Weil-Felix test (Proteus X 19) for typhus and Rocky Mountain spotted fever. The blood Kahn and Wassermann serologic tests were negative.

On October 20, the home physician advised us that on October 14 the patient had had a severe chill, and had had chills every other day since returning home, with the temperature on several occasions rising to 104 degrees. There was a pea-green stool on one occasion. The patient returned to Bismarck and was hospitalized on October 21, 1936. At the time of admission to the hospital we felt that malaria or atypical typhoid fever were the most likely possibilities. The temperature at the time of admission was 98.3 and the pulse 80. Stool examination the next morning showed no pus, blood, ova or parasites. Blood smears showed definitely the presence of *Plasmodium vivax* (tertian parasites). The leucocyte count was 10,500; the smear revealed 75 per cent polymorphonuclears.

On the morning of October 22, he had a definite chill lasting approximately thirty minutes; the temperature rose to 102.4 degrees. The temperature returned to normal within twelve hours and was normal the next day. On the morning of October 24, the patient had an aura, consisting of an indefinite feeling that he was going to have another chill, and ten grains of quinine sulfate were given. The temperature rose to 99.8 degrees and there was a chilly sensation, but no definite chill. Quinine sulfate was then given in doses of grains ten three times a day for five more days when he was dismissed from the hospital considerably improved. He was discharged with instructions to take quinine sulfate grains ten, every evening for sixty days thereafter. At the time of discharge from the hospital, the hemoglobin was 67 per cent, red blood cells 3,100,000. He was also given iron medication in the form of reduced iron, grains five, three times a day. The diagnosis was malaria, tertian type.

The patient advised us by letter on December 27, 1936, that he had felt very well since leaving the hospital and was gaining weight rapidly.

It is probable that this patient was infected with malaria while on a trip away from his home. The circumstances are, therefore, somewhat different than those in Weir's case, where the patient was apparently infected while living in Minnesota.

This report should emphasize the thought that malaria must be considered in differential diagnosis in this part of the United States.

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Bronchial Asthma

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BRONCHIAL ASTHMA was recognized as a disease entity by the early Greeks, who mentioned etiologic factors such as changes in the composition of air, water and food and also spoke of the influence of nerves on the cause of the paroxysms.

At the present time chronic asthma can be classified under two headings, namely the atopic and the non-atopic types. The atopic form of asthma is the one which is caused by extrinsic factors, such as foreign substances to which the patient has become sensitized. These foreign substances are known as allergens or atopens and can be demonstrated by positive skin tests and by means of specific antibodies or reagins in the blood. In the nonatopic type, no specific sensitization can be demonstrated. This latter type is often designated as infectious or bacterial asthma. However there does seem to be one thing in common with all asthmatics, and that is the allergic constitution which is inherited.

The history of most asthma cases reveals that they start with periodic attacks of asthmatic paroxysms as the result of a specific sensitization to some allergen, which is usually a pollen or animal dander. In the case of young children, the first offending substance may be a food. These attacks are seasonal in occurrence if due to a pollen sensitivity, or sporadic if due to a food or animal dander depending then on the time and amount of the food taken or the time and amount of exposure to the dander. Sooner or later they develop an infection which becomes superimposed upon an allergic or edematous mucous membrane. This leads to a chronic bronchitis, and then the patient begins to have asthma at any time of the year and under very different environmental conditions. This type of asthma is usually accentuated by any respiratory infection. Later on, these patients develop a thickened mucous membrane in the respiratory tract that causes an almost continuous asthmatic bronchitis.

In the nonatopic type of asthma we may be dealing with a form of bacterial allergy. Many workers have discovered a positive skin test of the delayed type to bacterial organisms recovered from cases of bronchial asthma. Many have also noticed rather severe constitutional reactions from small injections of such vaccine. Bacterial invasion of the respiratory tract causes an edematous inflammatory change of the mucosa that becomes redundant and polypoid in character, and with the increase of the mucous glands that thus occurs there is an increased amount of mucus which tends to dry out and form stringy threads and mucus plugs. Some of these mucus plugs occlude the smaller bronchioles and bronchi and cause lobular atelectasis. Pneumonitis may occur in these patches and later they become or-

ganized with connective tissue, gradually diminishing the aerating capacity of the lungs and the patient becomes short of breath on slight exertion.

The allergic type of asthma definitely belongs to the atopic or familial group of diseases, the most important of which are asthma, hay fever, allergic rhinitis, infantile eczema, urticaria, migraine, neurodermatitis and angioneurotic edema. This group of diseases have certain common characteristics, the most important of which is the hereditary tendency. Specific diseases are not necessarily inherited, but the tendency to inherit diseases in the group is very definite. Secondly the individuals usually have more than one of the diseases during a lifetime. It is not at all uncommon to see a child with infantile eczema later develop hay fever and finally end up with asthma. The stronger the allergic tendency in the family the younger the individual will develop allergic diseases. These patients develop skin sensitivities early in life and when tested with skin tests often react to many proteins with rather large urticarial wheals. The most common substances that are etiologic factors in asthma are foods, pollens, dusts, animal danders, feathers, hair, orris root and bacteria. These materials can be classified as ingestants and inhalants. Sometimes drugs are the etiologic agents, and aspirin particularly is a frequent cause of allergic asthma. These substances when they are the cause of asthma are called allergens or atopens. Allergens vary in their respective potencies. Partially autolysed, incompletely fermented and bacterially decomposed foods are usually more allergenic than are the same type of fresh foods. This may be due to a greater amount of histamine content. An over accumulation of allergens may occur because they enter the body in too great quantities, or because the destruction of them is too slow. This may be due to too great an appetite or to an inadequate digestion. Allergy is therefore a relative proposition so far as sensitivity is concerned. The big problem in asthma is not the sensitiveness of the patient to some particular allergen so much as it is the capacity of the patient to develop sensitivity to other substances. This capacity is inherited and probably is rooted in the biologic and physico-chemical structure of the chromosomes.

An allergic nose is a fertile field for a sinusitis to develop, and sensitizations are more apt to occur in a nose with poorly draining sinuses. There is considerable controversy as to which is first, the allergy or the sinusitis. The washing-out of an infected sinus containing pus often relieves asthma. Most sinus operations do not benefit asthma and radical surgery should be late rather than early in the treatment. Radical operations may result in better ventilation of the nose and sinuses, but not in much relief from asthma.

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There are secondary or contributory causes of asthma, but they have been over-rated. Such conditions as exposure of the body to cold or dampness with changes in the weather, over-exertion and excitement only lower the allergic threshold and make it easier for the allergens to poison the body. The asthmatic patient should at all times try to keep his body in the best of health by good care of the intestinal tract, securing adequate rest and sleep and avoiding any unnecessary exposure to temperature changes and other unhygienic conditions.

The first step in making a diagnosis in cases of asthma is the taking of a careful history. The family history is very important to determine if there is an allergic tendency in the family. The age at onset and the time of the year when the first attack came on are very important. It is also informative to know whether there had been any preceding sickness or any dietary or environmental changes at that time. Inquire whether any new pillows, cats or dogs or other animals had come into the environment recently. Then determine the subsequent history in regard to these new developments. Find out whether the symptoms are intermittent or constant, and if intermittent are they seasonal. Do the symptoms come on during the day or at night, at home or at work? Maybe the patient suspects certain elements in his diet or in his surroundings. Emotional upsets are precipitating factors at times and a careful history must go into this angle in detail. Asthma due to psychogenic disturbances are not infrequent and often the attacks come on as a result of mental strain or as a defense mechanism. After taking a history of this type the patient will be observing himself and will often make valuable suggestions from time to time about the effect of certain substances on his disease.

The next step is a careful physical examination paying particular attention to the respiratory tract. Removal of impacted cerumen is sometimes overlooked and reflexly it may aggravate allergic symptoms. Infected sinuses, nasal obstruction, dental infection and infected tonsils should be treated when in the judgment of the physician they may be contributing to the allergic state.

After the history and the physical examination the physician will probably have very definite ideas on the etiologic possibilities which he will want to investigate. Here the skin tests become valuable. The usual methods of skin testing in asthma cases are either cutaneous, sometimes called the scratch test, and the intracutaneous or intradermal tests. Scratch tests are more simple and require less expensive equipment and are less dangerous to use. They are the only tests that should be used on children and highly susceptible individuals. Intradermal tests are more sensitive, and can be used to check a questionable scratch test. In either type of test a positive reaction consists in the development of a wheal surrounded by a zone of erythema.

There has been considerable comment on the different methods of applying the skin tests and on the amount of the reaction obtained. We all know that all drugs used are more or less poisonous if not used in the proper

dosage. A dose of a certain drug is less for a child than for an adult depending on the age and size of the individual. In making skin tests with proteins on a sensitive individual one is applying protein substances to a scratch on the skin or by means of a needle to the intradermal tissues. Any one of these proteins may be toxic to the patient and the degree of toxicity is unknown. However with the use of a little caution the danger is not great. Below are a few rules that should be of value in preventing any serious result.

1. Do not make too many tests at any one time. If you do get a number of large reactions in a sensitive patient the summation will be enough to throw the patient into a constitutional reaction and we would like to avoid that.

2. If an urticarial wheal develops immediately after applying a scratch test and it continues to grow in size, wipe off the test substance instead of allowing it to react more, to prevent any more absorption of the allergen which may lead to a constitutional reaction.

3. It is wise not to make any intradermal test with any allergen until after you have a negative test with the scratch method. This is to avoid any serious reaction from some substance to which the patient may be very sensitive.

4. Never put an intradermal test on a child, for if you do this often it will only be a question of time until you will have a fatality.

5. Unless you have considerable experience with allergic cases it is advisable to let some one else do the intradermal testing.

6. Limit the number of intradermal tests to ten or twelve at any one sitting to avoid the possibility of getting a summation from too many positive reactions.

If a constitutional reaction should occur from allergic testing it would be advisable to apply a tourniquet above the site of the testing immediately to prevent further absorption and then to give a hypodermic injection of adrenalin, preferably at the site of the offending test.

Vaughn has suggested a new method for the diagnosis of allergy to a specific food. This consists of a leucopenic index or response of a drop of one thousand or more cells in any one leucocyte count or a drop of less than a thousand if it occurs in all or nearly all of the counts taken at fifteen minute intervals for one hour and at the end of one and a half hours. Zeller has recently confirmed the method to have 21 per cent more diagnostic value than the same number of skin tests to the same foods. He believes that the leucopenic index is of much greater value than the elimination diets.

Probably the best test as to whether a food is deleterious to a patient is to remove the food from the diet and observe whether the symptoms improve or not. Then reintroduce the food into the diet again and observe whether the symptoms recur.

Various types of elimination diets have been suggested, and the test diets of Rowe have been used extensively.

Brown has suggested a method he calls the "food addition" method which I like very well. The patient is given one food which if it agrees with him is used as a base on which to build his diet. A new food is added every few days according to the judgment of the physician. A large number of foods are added in this manner one at a time. If a food gives an unfavorable reaction it is placed on the list of reactors or offenders. This method works out very well where we have only the ingestants to consider. However most cases of asthma are also sensitive to inhalants and these must be removed from the environment if good results are to be obtained.

The treatment of asthma can be divided into the specific and the non specific types. The specific treatment is the one in which we are most interested as it offers the only hope of a cure in the disease. This consists in eliminating the active cause of the disease. When this is not possible the next best thing is desensitization to the offending allergen. Great care must be taken to see that the patient is really separated from the allergens which are responsible for his symptoms. Failure in the treatment of asthma is nearly always due to the fact that elimination of the positive factors is only partly accomplished. If the patient is sensitive to milk for instance he must not only avoid milk but also all foods that contain any milk. These patients are usually sensitive to so many things that a change in climate is not likely to be effective for any great length of time.

Sensitizations to pollen and house dust are usually best treated by intradermal and subcutaneous injections of the allergens, beginning with very minute doses and gradually increasing the size of the dose. Sensitization to danders is best treated by avoiding proximity to the offending animal and its environment, or any contact with its hair or dander through rugs, upholstery, clothing, curtains, *etc.* Orris root is best avoided by using some brand of cosmetics which are advertised as non-allergic. Other inhalants are best avoided by taking every means to avoid them in any part of the environment in which the patient must live. In my experience sensitization to feathers is one of the most common findings in all of my asthma and allergic rhinitis cases. This is probably due to the fact that practically all of them have slept on feather pillows all of their life and have thus become sensitized to them and are regularly breathing in large doses of the allergen every night. This factor can be eliminated by the use of allergenic encasings which are made of a light impervious covering for the pillows that keeps the feather dust from coming through the pillow and contaminating the air that the patient must breathe.

I have several cases of asthma in men who are bakers and who have positive skin tests to wheat flour. These patients only recovered when they changed their occupation. One warehouse laborer who had a severe case of asthma was sensitive to carton paper and did not recover until he changed his occupation. In the event that a person is sensitive to cotton or wool great care must be taken to avoid contact of these substances in

clothing, blankets, and mattresses. Here allergenic encasings for mattresses are useful again. In the case of sensitivity to drugs, it must be borne in mind that even minute doses of the offending drug may be combined with other drugs used in the treatment of the asthma, and then instead of giving relief the medicine may aggravate the disease. This is particularly true in the case of aspirin.

Let us not forget that after all we are treating a human being rather than a disease, and it is advisable to build up body resistance as much as possible. Attempt to avoid the allergens to which the patient is sensitive, but at the same time use any measure that will build up body vitality and general health. It is advisable to give a well balanced diet rich in vitamins, particularly vitamin C. After foci of infection have been removed it is sometimes advisable to give a vaccine. I do not think that autogenous vaccines have any special value that are not obtained with the average stock respiratory vaccine which can be purchased from any reputable laboratory.

Climatic changes are beneficial to those cases that have a preponderance of infection and especially if there is much pulmonary change. In the case of younger people they should always have the benefit of a thorough allergic study before changing of residence is considered. In young people the infection often clears up remarkably after clearing up the allergic factors. If climatic change is considered the Southwestern states are preferable, particularly Arizona because of the low relative humidity and the relatively even temperature.

Air-conditioning of homes is a very definite step toward securing a dust-free home atmosphere, and undoubtedly will be a great relief to many an asthmatic patient.

Deep-breathing exercises have been advocated by some European physicians. Livingstone and Gillespie have reported a definite improvement in 52 out of 75 patients treated by ten minute exercises wherein the patient takes short inspirations through the nose and follows with long expirations through the mouth.

One of the most important recent improvements in the symptomatic treatment of asthma is the rather simple finding of Graeser and Rowe demonstrating that the inhalation of one to one hundred adrenalin could produce relief of symptoms in a certain number of asthmatic patients. While this method does not replace the time-tried and efficient hypodermic administration of adrenalin, it is most acceptable and is a useful adjuvant in the treatment of select cases.

Other valuable drugs in the symptomatic treatment of acute attacks of asthma are ephedrine, especially when combined with synergistic drugs such as phenobarbital or amylal and theophylline. In the severe cases of status asthmaticus, it may be necessary to use morphine by hypodermic or even give ether inhalations to relax the patient.

Balyeat and his associates continue to recommend the intratracheal injection of iodized oil in cases of intract-

able asthma. They suggest that 5 cc. or 10 cc. of the oil be instilled at bi-weekly, weekly, or monthly intervals. Of 50 patients with severe forms of asthma who failed to benefit from allergic management 35 cases were reported as having good results by the addition of the iodized oil treatment. They believe the iodized oil treatment efficient in the correction of the mechanical obstruction by the tenacious sputum or purulent mucus. Cohen has treated four cases of status asthmaticus in the past year with bronchoscopic drainage and saline irrigation. From one to four weekly treatments were given to secure relief.

Summary

Asthma can be classified under two headings, namely the atopic and the nonatopic types. The atopic cases are hereditary and are due to sensitivity to allergens. The nonatopic cases are probably a form of bacterial allergy.

In the diagnosis of asthma the history is very important, especially the family history of allergic diseases and the association of the attacks with exposure to foods and inhalants.

Next the skin tests are valuable in making a diagnosis. We have the scratch test and the intradermal test. The latter should not be used by the average physician unless he has had considerable experience in allergic cases. The scratch test is very useful and relatively safe. It is the only test that should be used on children as the intradermal test may cause too severe a reaction or even death.

Vaughn has recently described the leucopenic index, which consists in the lowering of the leucocyte count over one thousand cells for a period of over an hour after the ingestion of a food to which the patient is allergic. Counts are taken every fifteen minutes for about an hour and a half. This is a slow, trying method to use except in select cases.

Various types of elimination diets have been used with some degree of success.

The best method is to eliminate all the positive allergens from the diet and surroundings and this means to completely do away with them. This is not always so easy to do as to say it. Where complete elimination is not possible, desensitization may be tried. This is valuable principally in cases due to pollen and dust.

Change of occupation is sometimes necessary to cure a case such as a baker who is sensitive to wheat flour dust and a warehouse laborer who is sensitive to carton paper from carton boxes he must handle all the time. In the case of feather sensitization or cotton, pillows and mattresses can be covered with allergenic encasings.

Vaccines may be valuable after foci of infection have been removed. Indiscriminate tonsillectomies, nasal and sinus operations have no place in the rational treatment of allergic asthma.

Changes in climate are of value when the patient moves away from an atmosphere full of allergens to one relatively free from offending allergens. The Southwestern area of the United States is a good haven for such cases due to the more even temperature and the relative low humidity.

Inhalation of adrenalin is one of the more recent methods of alleviation in the milder attacks of asthma. The severe attacks may require hypodermic administration of adrenalin or morphine or even the inhalation of ether. Status asthmaticus is being treated now by intratracheal injections of iodized oil by a number of clinics.

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The Management of Pernicious Anemia In Private Practice

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RICHARD CABOT in 1908 in reviewing all the then reported cases (1200) of pernicious anemia, remarks that the disease is not commoner in certain localities but that it is commonest wherever it is most carefully sought. We have all been taught to recognize the classical picture described by Addison which the name pernicious anemia brings to mind. Yet, in its

early stages, it is capable of producing illness long before blood changes warrant more than a presumptive diagnosis. And even in its advanced stages, there are difficulties in its recognition; for this deficiency syndrome may accompany more important disease, such as carcinoma, or it may itself be masked by the presence of less important disease or some of its own complications.

An authentic case is considered by the author to be one that has had, in addition to suggestive symptoms,

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objective support for the diagnosis in the form of a blood picture at some time compatible with the disease, an absolute absence of free hydrochloric acid after histamine, and a typical response to potent liver extract. Only twenty-five such cases have passed through his hands in four years. In this small and unimportant number there are two cases whose onset was at the age of twenty-three and twenty-four years respectively and there is one group of four brothers. These cases are of interest out of proportion to the total number of cases seen, because the disease is considered distinctly rare under the age of thirty, and because there has been no report of four authenticated cases in one generation in the literature.

In his four years in this community, a small center drawing from a large area, the author has had for prolonged management sixteen authentic cases; six of these for four years, six for three years. This small number warrants only a discussion of the management of these cases under circumstances peculiar to the community and the type of practice. Some characteristics of the disease are discussed, but only as they relate to the recognition of cases for management.

The Recognition of the Disease

There are pitfalls in the evaluation of the importance of even a classical pernicious anemia syndrome.

The syndrome may be overshadowed by what appears to be a more probable essential diagnosis. Nine of my cases were admitted to the hospital in a critical condition; four of them with a presumptive diagnosis of gastro-intestinal malignancy, and two with a diagnosis of bronchopneumonia. One had large masses in the abdomen, which it was concluded later were a greatly enlarged spleen and liver, but at the time led the attending physician to object to a trial of liver extract because of the apparent certainty of the presence of advanced abdominal malignancy. This patient, seen in 1934, is still alive and well, in spite of advanced age.

One significant point in these almost moribund cases is the fact that very few diseases other than pernicious anemia are seen with the red cell count a million-and-a-half or under. Three of these very critical cases had blood counts under a million. The color index is not always helpful because of the inaccuracy of the hemoglobin colorimeter at these levels. The sensorium is usually so clouded that it is impossible to obtain any information about the sensory changes of postero-lateral sclerosis that might be present.

A final diagnosis cannot be made when the patient is extremely weak, semi-stuporous, often running a fever, and apparently almost moribund. In such cases, however reasonable the past history and present findings may be for a hopeless disease, a thorough therapeutic trial of liver extract is indicated.

On the other hand, the presence of the pernicious anemia syndrome may result in the overlooking of more important disease, especially in the gastro-intestinal tract.

I have seen three cases that fulfilled in every respect all the requirements noted above for an authentic case of pernicious anemia. Two of these had advanced carcinoma of the stomach, easily demonstrated by X-ray examination after liver therapy had brought about sufficient improvement so that the patient could cooperate for the examination. The third case had a palpable mass in the ascending colon which was felt on the first admission. All the criteria for the diagnosis of the pernicious anemia syndrome were present. The reticulocyte response at the maximum was 42%. The patient refused operation when it was urged at a time when he had regained his strength and his blood was normal. This particular neoplasm was of the slow-growing type and he lived for two years. He did not keep up his liver extract therapy, and suffered a relapse which brought him into the hospital when he again responded to liver therapy.

If in the critical stage one decides that pernicious anemia is the sole diagnosis and obtains a splendid and typical response to liver therapy, the incentive to further study may be dulled and neoplasm, usually of the stomach or colon, be overlooked. In cases of this type, if the pernicious anemia syndrome is present there will be a marked response to parenteral liver and this fact should be utilized in order to improve the patient's condition sufficiently to permit conclusive diagnostic investigation.

While the critical case is responding, certain observations should be made which are essential to establishing the diagnosis of idiopathic pernicious anemia and the presence or absence of other important pathology. While the blood is still down, the blood picture should be carefully studied. Too much attention should not be paid to the color index because with infection or some other coincident disorder, there may be actually a color index less than one. For a person who is not a trained hematologist, the most important features of the blood smear are the large red cells or macrocytes (well-filled with hemoglobin if the color index is high), and the presence in the smear also of abnormally small red cells or microcytes and cells of bizarre shape. The reticulocyte response is not always in proportion to the lowness of the red blood cell count, but the reticulocyte count should show six to eight per cent as a minimum, and it may reach sixty per cent. Even though the color index be low, no iron should be administered during the period of response.

During the period of response it is significant that the patient's mental symptoms clear, and an uncoöperative, querulous, often irrational patient shows complete clearing and reveals a coöperative and pleasant personality. When the patient gains sufficient strength and mental clarity, the history should be carefully reviewed. Often a complete new history can be elicited, bringing out such points as recurrent diarrhea, intermittent sore mouth or tongue, and paresthesias of the hands and feet. When the patient is able to cooperate clearly, loss of vibratory sense in the ankles should be tested for by means of the tuning fork.

As soon as the patient is strong enough, gastric analysis is carried out and must show a complete absence of free hydrochloric acid following histamine.

In even the most easily recognized case in relapse which is seen while still ambulatory, it is essential to have the gastric analysis, and wise always to have general gastro-intestinal studies. The deficiency is a life-long affair and in the course of a long life the patient is heir to all the other diseases of mankind.

At the other extreme from these semi-moribund patients is the group of patients who are in the early stages of the disease, but who are, practically speaking, undiagnosable at the time they are seen because of the absence of anything characteristic in the blood picture. In January of 1931, one* of my cases was seen with a welter of bizarre and inconsequential symptoms, among them tingling of the hands and feet. In October of 1933, he was examined on account of vague gastro-intestinal complaints. No free hydrochloric acid was found after histamine in the routine gastric study. The hemoglobin then was 80 per cent, with red blood cells 5 million, and nothing abnormal was noted in the blood smear. When I saw him in December 1935, four years after he sought aid for vague ill health, he was an easily recognized case with early cord changes. Even then his signs and symptoms were out of proportion to the blood count which showed 3,880,000 red blood cells and a hemoglobin of 60 per cent. The smear, however, showed many well-filled macrocytes; marked variation in the size of the red blood cells and their shape.

Some of my cases had unmistakable prodromata for seven or eight years preceding the first recognized relapse. Two were studied carefully in a large medical center several years before I saw them, one of them with pernicious anemia in mind. Consideration of the fact that the disease has a long insidious onset, and that it is characterized by spontaneous remission; consideration of the fact that a known case which is maintained below the optimum level, will continue to be ill and may develop spinal cord changes, force one to make every effort to recognize the presence of the pernicious anemia syndrome before it is possible to diagnose it positively from the blood and the physical findings.

A case to be placed in the presumptive group should show achlorhydria and should show evidence in a careful and long drawn out history warranting the presumptive diagnosis. If in any of these cases there is definite evidence of postero-lateral sclerosis, the patient should have a therapeutic trial with careful evaluation of the results of adequate doses of liver extract, and the continuance of therapy should be dependent on the results obtained. This procedure, if one is careless, may result in unnecessary therapy; but that is less to be regretted than unnecessary suffering and unnecessary disability from spinal cord disease.

In cases where the history is suggestive of possible pernicious anemia, while the blood picture is still too

high to give any characteristic changes, if there is no evidence of spinal cord change, it is wise always to put such a patient on large doses of iron and to check the blood at intervals. Such a case will show maintenance of the hemoglobin or even improvement in the hemoglobin with a gradual drop in the red blood cell count and finally the development of a typical blood smear even though the patient has not been permitted to become seriously ill. In two cases where the diagnosis seemed doubtful this method of withdrawing liver and giving large amounts of iron resulted in changes that were dramatically convincing in a few weeks or months.

Management—General Consideration

The parallelism between adequate management of a pernicious anemia patient and a severe diabetic is obvious. In both, adequate control of the deficiency syndrome by continuous substitution therapy insures a long, active and useful life. If this goal is to be achieved, the selection and use of the most effective potent substance is only one consideration of management; no little attention must be given to the education of the patient and to economic and even domestic and geographic considerations. The Hippocratic aphorism is peculiarly apt; not only must the physician have knowledge of the disease but the "externals must be made to coöperate."

The Selection of Potent Substance

Reports on large groups of cases demonstrate that the concentrated solution of liver extract given intramuscularly is most effective in maintaining the red blood cells at a proper level, and is the most economical. Before this preparation was available, it was impossible to maintain many patients at a sufficiently high level for sound health and to prevent spinal cord changes. Most patients prefer 12 to 50 intramuscular injections yearly to several nauseous oral doses of active substance daily. Control is better, for if the patient is seen for regular injections, he can have blood counts at proper intervals and his occasional discouragement and tendency to rebel can be counteracted.

Only those patients should be treated by oral administration whose fanatic prejudice against "hypodermic injections," or whose almost hysterical hyperesthesia and fear of the pain of the injection cannot be overcome. Real discomfort is nil with the concentrates of one cc. and one-half cc. volumes which are tolerated even in the deltoid muscle.

In the selection of the volume concentrate it should always be borne in mind that in the concentration process some of the potency is lost; thus, if the active substance of 100 gms. of liver is concentrated down to three cc., that three cc. will have more potency than if further concentration is carried out to the point where a one cc. volume is arrived at. I have demonstrated repeatedly to my own satisfaction on well-controlled and well-maintained patients over a period of many months that a one cc. concentration made from a hundred grams of fresh liver is not quite as effective as a three cc. solu-

* (T. No. 23604)

tion, although each is derived from a hundred grams of fresh liver. The choice for administration between these concentrations should depend on the patient's choice between large volumes (three to five cc.) at longer intervals, and small volume (one-half to one cc.) at shorter intervals. The more phlegmatic patient will prefer to take the larger volume at the longest possible interval. In selecting any product, the important consideration is the amount of liver from which the concentrate is derived and its degree of concentration; not the startling figures for the amount of fresh oral liver it takes the place of.

The economic advantages of intramuscular extract are striking. Where the ventriculin or concentrated liver powder in bulk or in capsules was used orally the cost in this locality of the material alone ranged from \$110.00 to \$130.00 per year, depending upon the amount of substance needed by the individual. To the cost of material would have to be added the cost of an occasional blood count and an examination by the physician, a total of from \$16.00 to \$40.00 at local rates.

Contrast these costs with those possible for optimum maintenance with the liver solution; 10 cc. ampules of satisfactory solution can be obtained retail here for \$1.25; a box of four three cc. ampules can be obtained for \$2.00. The most severe case may require a dose of three cc. every seven days, but it is more usual to have excellent maintenance on a dosage of three cc. every three weeks or five cc. every month. Using the 10 cc. ampule, an average degree of deficiency can be carried on 12 doses of five cc. costing a total for material of \$7.50 a year. Using the smaller, more convenient three cc. ampules, the cost of materials is increased (18 doses or four and one-half boxes at \$2.00) to a total of \$9.00. The most severe case may need \$27.00 to \$50.00 worth, if more expensive concentrations are used.

It is possible actually to keep an indigent patient in good health for as little as \$10.00 a year if medical service is gratis. In the person of average means, the cost of administration is \$1.00 to \$2.00 for each injection; or \$20.00 to \$35.00 for the average case. In our community, a red blood cell count and hemoglobin can be done for \$2.00 an examination. Four to eight counts a year are enough for the patient who is kept up; or \$8.00 to \$16.00.

Total costs orally: \$110.00 minimum to \$170.00 maximum.

Total costs intramuscularly: \$10.00 minimum for county cases; \$30.00 to \$40.00 for average (majority of private cases); \$110.00 for even the most refractory cases which could never have been kept up by the oral method.

Procedure in Different Stages of the Disease

The Critical Stage: The *sine qua non* of treatment is a generous over-supply of active principle. To this end, five cc. (166 gms. of fresh liver) of concentrated solution is given in alternate gluteal muscles for three

successive days. Then, depending on the response, five cc. at two-day intervals or three-day intervals is given, and finally five cc. every week until the patient has regained strength and the red count is above 4.5 million. One cannot foretell the rapidity of response in any individual, and it is better to give too much than to give a little under the optimum, and have a slow response or have to decrease the interval later on. If the gluteal region is in bad condition, the small volume concentrates of one-half to one cc. in the deltoid muscles daily are effective.

During this stage, blood counts and reticulocyte counts are taken daily; if there is no objection from the standpoint of expense. The reticulocyte count is particularly important if the diagnosis is doubtful; it is taken daily until the reticulocytes have fallen to about five per cent.

If the red blood count on admission is below a million, or if fever or the commonly found signs suggesting low grade bronchopneumonia are present, it seems best to give supportive treatment in the form of a transfusion. Many of these patients are aged and may have coincident heart disease that requires appropriate treatment.

Convalescent Stage: As soon as the mental symptoms have improved sufficiently, a more searching history should be taken and the patient tested for the signs of postero-lateral sclerosis. When the general strength has improved so that satisfactory X-ray examination can be done, malignancy should be ruled out.

During this stage one often finds the hemoglobin lagging behind the red cell count and, if the diagnosis has been adequately established, reduced iron (0.5 gm. *q.i.d.*) is given. If there is any evidence of lag in the rise of the red cell count, the five cc. weekly dosage is increased to two or three times a week.

Maintenance Stage: At this stage the red blood cells should exceed four and one-half million and the patient should feel well. The dosage and interval necessary will vary with the degree of deficiency in the individual. This can be determined only by checking the red blood cell count (not the hemoglobin) at certain intervals. If the dosage and interval are such that the amount of active substance given the patient is only slightly sub-optimal, the fall of the blood cell count will be slow, and while frequent readings of the red blood count is of interest, a three months' interval is adequate enough. Even the uncoöperative patient who has abandoned his liver may not show any appreciable drop for six months. By adjusting the amount and the interval, the count can always be, and should always be, kept in excess of four-and-a-half million.

My practice, when seeking to determine the necessary amounts and interval for an individual, is to have the patient receive five cc. weekly for four weeks after the blood has reached four-and-a-half million. The interval is then widened to ten days or two weeks and either three cc. or five cc. (derived from 100 to 166 gms. of fresh liver) is given depending on the estimate of the

degree of the deficiency; this dose and interval is continued for three months. If the blood has been well-maintained and is close to five million, the interval is then widened to three weeks, and no change made for another three to six months. Finally, the interval is widened to four weeks or a full month, using a three cc. volume derived from 100 gms. of liver. If the blood drops, the interval is shortened or five cc. is given. If, after three to six months, the blood is maintained on this interval and the three cc. dosage, the patient is given the option of using the one cc. concentrate derived from 100 gms. of liver to see if he is one of those relatively rare individuals who will over a long period of time maintain his blood on this concentration and interval.

It is desirable for reasons of economy and convenience to have the interval between three and five weeks, and this is best accomplished in most cases by a three cc. or five cc. volume. If the patient chooses the smaller volume, the one cc. dosage usually maintains him well at two or three week intervals. When one is in the act of widening the interval and decreasing the amount of substance to determine minimal need for optimum maintenance, one should not assume that the latest change is adequate until three to six months or more have passed.

In my experience, the well-maintained patient rarely derives any benefit from hydrochloric acid. At present, I do not routinely give vitamin B; I prefer for economic and psychological reasons to enforce the present *sine qua non* of therapy:—adequate parenteral liver.

Other Considerations in the Management

There are important details of management other than those related to dosage. Care must be taken either during the convalescent period or in the early maintenance period to acquaint the patient with the nature of his disease and its difference from ordinary secondary anemia. It must be impressed upon him that to neglect advice is to risk his life, health, or gradually-developing disability. He should be acquainted with the fact that abandoning treatment may not make him feel ill for months. Even a dramatic comparison of his inevitable fate ten or fifteen years ago with that of his present outlook of a normal active span of life is justifiable, in order to relieve his bitter disappointment over the fact that you cannot "cure" him. When iron is given him, it should be explained that it is simply to pick up the lag in his hemoglobin and he should be warned against reliance on any of the iron liver mixtures which are invariably inadequate for any authentic pernicious anemia patient. Unless such precautions are taken, the patient is almost surely going to stray from the path, on the advice of friends or because of the promises of the uninformed.

He should further be instructed to have a red blood cell count at least once in three months, and to see that his interval is changed or the dosage changed in accordance with the level of the red blood cell count; regula-

tion by the number of blood cells and not by the hemoglobin must be emphasized since it is still quite common practice for the hemoglobin alone to be taken.

If on account of distance or isolation it is impossible for the patient to have his treatments in the physician's office, he should be furnished a prescription for a 10 cc. vial or for the more convenient ampules of concentrated liver extract and a five cc. syringe with needles two inches to three inches in length of a gauge twenty. In this community, ranches and villages are often inaccessible on account of distance in good weather, and on account of storms in bad weather. Some member of the family may have to be instructed in the proper technique for giving the intramuscular injection. Lay individuals administering the extract should be cautioned to give it intramuscularly. So far, even in my patients whose injections are given by an instructed member of the family, no abscesses have developed; and painful lumps have obviously been the result of injections made subcutaneously.

If the patient is indigent, arrangements should be made promptly with the local welfare authorities to assure the supply of material in the most economical form. Authorities respond to the explanation that the \$10.00 to \$20.00 spent for keeping this patient in health and ability to work, would only pay for the first few days' hospitalization in the event of relapse from neglect.

If in spite of all these precautions, the patient is willfully careless and has a relapse, he should be handled with patience as one who has rebelled against a life sentence. One or two minor relapses plus understanding and sympathy usually turn an unmanageable patient into a well-disciplined, healthy and active man who is a credit to his physician.

Illustrative Abstracts From the Case Histories of Four Brothers

* Only those portions of the records are abstracted which bear on the recognition and on the management of the disease.

H. No. 25356: The first of the four brothers contacted. Seen on 5/8/34 at the age of 38; diagnosis established then. His history indicated onset three years before; he recognized the similarity of some of his symptoms to those of two of his brothers previously diagnosed as pernicious anemia. He had kept himself on his feet after a fashion by taking liver by mouth in a haphazard fashion; most recently he had been taking fifteen tablets of a liver iron mixture daily. He was so weak as scarcely to be able to walk although no cord changes could be detected. During the three years he had consulted no physician. He was of an extremely unstable temperament constitutionally (and to some extent because of his illness). He refused hospitalization. He fainted when three cc. of liver extract was administered intramuscularly, and refused emphatically to take

* There are seven other living siblings; when (and if) more of them can be checked, this interesting "pernicious anemia family" will be reported in detail.

anything but oral medication. Throughout 1934 he was scarcely able to work, although he took active principle in the form of powdered liver extract and ventriculin equivalent to that derived from 500 to 600 grams of fresh liver every day.

(*Explanation:* Three cc. and five cc. volumes are of a concentration such that three cc. is derived from 100 gms. of whole liver; one cc. volume is of a greater concentration, so that one cc. is derived from 100 gms. of whole liver. R. refers to red blood cells. The number of red cells is given in millions.)

5/8/34 R. 2.3, Hb. 44 per cent. Blood smear compatible with that of pernicious anemia in relapse.

5/24/34 R. 2.4	} Oral liver powder and ventriculin equivalent to 500 to 600 gms. of fresh liver daily. Would not take more.
6/11/34 R. 2.6	
7/26/34 R. 3.1	
9/ 4/34 R. 3.3	
10/ 1/34 R. 3.0	

In the spring of 1935 he was finally persuaded to begin intramuscular extract. There was prompt response and by April 1935 the blood was up beyond four-and-a-half million.

6/15/35 R. 5.1 Three cc. q 14 days since April 1st, continued; working hard now.

9/24/35 R. 5.0 Three cc. q 21 days begun.

1/7/36 R. 5.6 One cc. concentrate q 21 days begun.

6/2/36 R. 4.8 One cc. q 21 days continued.

8/21/36 R. 5.2 One cc. q 21 days continued.

12/28/37 Reports blood up on same régime. Travels extensively through several states; carries ampules with him.

Orally the derivative of 500 gms. of fresh liver daily kept him alive in poor condition; intramuscularly the derivative of 100 gms. q 21 days (17 times a year) kept him in good health.

T. No. 23604. Diagnosis established at the age of 53. Came in at my request because a record available to me showed the complaint of tingling of the hands and feet in 1931, and the absence of free hydrochloric acid after histamine in a gastro-intestinal examination in 1933. The blood count then was: 10/4/33 R. 5.0 Hb. 80 per cent and the blood smear showed nothing suggestive, at that time, of pernicious anemia.

On 12/28/35 he had the symptomatology, progressively more apparent in the past two years, of pernicious anemia; he had definite evidence of postero-lateral sclerosis, and the blood smear showed many well filled macrocytes and many microcytes and abnormal shapes. He was placed under treatment as outlined above with rapid and marked subjective improvement.

12/28/35 R. 3.9. Five cc. to total 30 cc. in 10 days.

1/9/36 R. 4.4. Five cc. q 7 days begun.

2/19/36 R. 5.0. Three cc. q 14 days begun.

1/10/38 Reports well and active; one cc. q 14 days. Managed in distant corner of the state.

The onset was insidious and covered several years.

M. No. 30172. Diagnosis was established in April 1931 at the age of 39. Five years previous to this he had been studied for a gastro-intestinal condition at a prominent medical center where achlorhydria was noted; but the blood studies were negative.

In April 1931, the red blood count was 1.6; Hb. 52 per cent. A fair degree of health maintained since then on three tablespoons of concentrated liver extract daily.

First seen by me on Nov. 15th, 1935. Came to inquire about intramuscular liver which he had heard of from brothers H. and T. 11/15/35 R. 4.2. Hb. 83 per cent; five cc. q two weeks begun.

The smear was carefully examined, but except for slight predominance of well-filled macrocytes nothing striking was noted. Instructed to adapt the volume and interval to the blood count when it had risen well beyond four-and-a-half million. Reported in June 1936 and December 1937 that he was maintaining his blood well above four-and-a-half million on three cc. concentrate at three weeks' interval. Lives at a distance of 450 miles.

J. No. 30973. Diagnosis established in 1932 at the age of 57 on the basis of the effect of therapeutic trial of fresh liver. At that time he was scarcely able to walk because of weakness and shortness of breath one-half pound of fresh liver daily restored him remarkably, although he did not regain vigorous health. After a few weeks he started on powdered liver in an amount representing 500 gms. of the fresh substance daily.

When seen by me on June 2, 1936, he had the signs and symptoms of the disease with marked cord changes. The blood smear was compatible with pernicious anemia in relapse.

6/2/36 R. 3.4. Three cc. concentrate q 7 days.

7/1/36 R. 4.5. Three cc. concentrate q 7 days.

8/22/36 R. 4.7. Began three cc. concentrate q 14 days.

10/17/36 R. 5.3. Three cc. volume concentrate q 14 days, ordered continued until the next count.

Nov. 1936. One cc. volume concentrate q 14 days begun at brother's suggestion.

.Not seen for five months; feeling badly on return.

3/26/37 R. 3.6. Five cc. (from 166 gms. liver); total 25 cc. in 16 days, then five cc. q 14 days.

5/1/37 R. 4.0. At this point the patient chose the lesser volume at closer intervals, and he was placed on the one cc. concentrate at seven-day intervals.

8/21/37 R. 4.9. One cc. q 7 days.

11/26/37 R. 4.8. One cc. q 7 days.

This case and others similar to it demonstrate the fact that in the increasing concentration of 100 gms. of fresh liver there is some loss of potency.

In analyzing the intervals and volumes the wide variation in the degree of deficiency in these four cases in-

dictates the necessity of individualizing the maintenance dose, thus:

H. requires one cc. q 21 days.

T. requires one cc. q 14 days.

J. requires one cc. q 7 days.

M. requires three cc. q 21 days.

H. T. and J. chose the more concentrated solution at shorter intervals for reasons of comfort, even though J. was definitely demonstrated to be controllable on the more dilute concentrate of three cc. q at two week intervals.

Summary

1. The practical details of the management of pernicious anemia cases in private practice are discussed.
2. The therapeutic superiority and the economic advantage of intra-muscular therapy are elaborated upon.
3. The value of a therapeutic trial of liver extract in critically ill patients presenting the pernicious anemia syndrome is brought out, and the advisability of a therapeutic trial in those patients with suggestive signs and symptoms, but with normal blood pictures, is discussed.
4. To illustrate some of these points, the case records of four brothers with pernicious anemia are abstracted.

Side Lights on Early Montana Medical History

Harold W. Gregg, M.D., F.A.C.P.

Butte, Montana

THERE IS, apparently, something in the make-up of all of us which gives us something of the spirit of exultation when we stop to examine the footprints of the sturdy, forward-looking men who have done their work and have gone on before—when we occasionally stop to consider perfectly ordinary events that happened in the early days of the land on which we tread today. This is perhaps more true of those of us in medicine, as we remember the work of early medical men, especially in our own locality.

Every important nation has a pride in its history, and every profession has a right and duty to recall the lives and characters of the men who builded the profession in their state. There is inspiration in it for every-day living and working. There is much in the medical history of Montana that is of very great interest; and perhaps it is not known to many of the present members of the profession. However, for several years a committee of the state medical society has been gathering material and having material gathered for a complete medical history of Montana. This is now being edited, and much material which until now has been hidden will soon be available to every man in the profession. It is too bad that this work could not have been started earlier, because much of this early history is even now forgotten, and the books on general Montana history are very, very poor in any medical history material.

Of course it is impossible in a short paper even to begin to cover the field of early Montana medicine, and with many of the men who personally saw the building of our profession in Montana still in our midst, it is somewhat presumptuous for me to even try to outline our state history. However, it may be interesting to call to mind certain sidelights in the history of our profession in Montana up to the 1860's. I am sure it would be just as interesting to go further and narrate some of the later history made by that splendid group of medical men who came to Montana in the eighties and nineties, and lived through the stirring days of changing medicine

here in our own state. Some of these men are still with us, and it is to be hoped that some of them will leave memoirs of their early work.

Of course, when we speak of early Montana medicine we should go back to the days even long before the territory was settled, and might even begin our study with the medicine men of the different Indian tribes; however, Indian medicine seems to have had many common features in all the tribes, and much of the history of Indian medicine in Montana is the history of Indian medicine in all the country. Their solution of illness was, of course, that the victim was possessed by an evil spirit, and even their use of herbs and of the healing power of hot springs and mineral springs was probably only an attempt to find something that would charm the evil spirits. But there are many interesting bits of Indian medicine lore that concern our early study of medicine in Montana, and we shall come to these in connection with the other narrative.

It is more than interesting that the first work in medicine in our territory was done by Lewis and Clark during their expedition. Their journal abounds in references to their attempts at medical practice, as well as much general information as to certain herbs and minerals which were found and used by the Indians as medicines. I believe the journal of Lewis and Clark is a document that should be read by every medical man in the northwest, not only because of its general interest, but because of its medical interest. It is truly remarkable what painstaking observations these men made and just as painstakingly set down in the record, through the long months of stress and danger and hardships. It is truly an American saga.

In 1923 Mr. Doane Robinson, the state historian of South Dakota, read a paper at the unveiling of an oil portrait of Dr. F. A. Spafford, presented by the South Dakota State Medical Association to the state. This address was called "The Medical Adventures of Lewis

and Clark." Mr. Robinson painstakingly went through the journal of Lewis and Clark, picking out the interesting medical references, and found very much that was of interest. I have spent many hours with the journal, both before and since that time, and even at the risk of repetition, I should like to set down some of these bits which may have been read by the South Dakota profession, but are not generally known to the men in Montana.

Jefferson's instructions to Captain Meriwether Lewis when Lewis and Clark were being commissioned to make the trip are of interest.

"As an aid to commerce," Lewis was commanded to study the Indian tribes, and among other things to study especially the diseases and remedies they used, the moral and physical circumstances of the tribes, and the conditions of reason, justice, morality, and religion among them. Thomas Jefferson must have been a pretty thorough-going scientist for his period. Of course, Lewis and Clark's study was not done in the name of science, but as Jefferson put it in his instructions, "only as an aid to commerce."

Lewis and Clark's party included nine young men from Kentucky, fourteen soldiers of the United States regular army, two French watermen, one interpreter, one hunter, and one black servant. A doctor was not included; perhaps they felt that the type of doctor they could get to go with them would be much less of a scientist than they themselves, and would probably be excess baggage. Even so, the papers of Lewis and Clark contain so much relating to health, medicine, medical practice, and surgery, that an examination of the narrative is very interesting, especially to those interested in the history of early northwest medicine.

As part of Jefferson's instructions he made out a questionnaire which is about as follows:

This questionnaire was copied by Captain Clark from original instructions, and pertains of course to the Indian tribes among whom Lewis and Clark might find themselves. I am going to set this questionnaire down because of its interest.

What is their state of life as to longevity?

At what age do both sexes marry? (The spelling and grammar in Clark's copy is very strange to moderns, but their records are none the less remarkable.)

To go on with the questionnaire—

How long do the women suckle their young?

What is the child's diet after weaning?

Is polygamy permitted among them?

What is the state of pulse in both sexes—children, grown person, and in old age, by feeling the pulse morning, noon, and night?

What is their most general diet and manner of cooking, time and manner of eating, and how do they preserve their provisions?

What time do they generally eat and sleep?

What are their acute diseases?

Are rheumatism, "pluricy," or bilious fevers known among them and does the latter ever terminate in vomiting of black matter?

What are their chronic diseases? Are palsy, apoplexy, epilepsy, madness, "goitre" or swelled neck, or the venereal disease known among them? (Venereal disease is in the singular in Clark's copy, and although there is no definite answer to the question recorded in Clark's paper, it is apparent that some of the soldiers and other men found this out without any great amount of scientific endeavor, because it is recorded that soon after Lewis and Clark and their party left the Mandans, several of the men had venereal disease—whether syphilis or gonorrhea the record does not say).

What is their mode of treating the smallpox particularly?

Have they any other disease amongst them, and what are they? (*The grammar is Clark's*).

What are their remedies for their different diseases? (*Remedies spelled "remidies"*).

Are artificial discharges of blood used among them?

In what manner do they generally induce evacuation?

Do they ever use voluntary fasting?

What is the nature of their baths and what time of the day do they use them?

At what age do their women begin and cease to menstruate?

History has shown no definite answers to the parts of this questionnaire, but from the general narrative and the surgical and medical materials which they took with them it is evident that they made as complete a study in this direction as possible. I shall not give a list of these medical and surgical supplies, but I imagine that it included most of the materials which would have been considered necessary for such an expedition by the medical men of this time.

Among these medical supplies were fifteen pounds of powdered bark. This was probably Peruvian bark or cinchona, as there are frequent references in the records of the use of cinchona.

Many references are made to the prevalence and savagery of mosquitoes, especially in Montana; however, this has nothing to do with Peruvian bark, as the relationship of the mosquito to malaria was not known at that time, and our Montana mosquitoes are not now, and were not then, of the species *anopheles*.

The list also included ten pounds of Epsom or Glauber's salts. Clark's conjunction is "or". Whether or not the two salts were supposed by Clark to be identical I do not know; it is not probable, however, and the one was probably an alternative if the Epsom salts could not be obtained.

The list also included two dozen "B. rush billious pills." In the record, Rush is spelled with a small "r",

although these Rush bilious pills are, I suppose, named after the famed Dr. Rush, of Philadelphia. Perhaps Clark felt that Rush was an adjective relating to the physiological and cathartic effects of the pills; and for this reason spelled it with a small "r".

The cost of these medical and surgical supplies was at that time \$90.69.

They had in addition to this, of course, thirty barrels of wine, some sugar, salt, *etc.*, which might be considered medical supplies.

At St. Louis, Lewis and Clark met a Dr. Antoine Saugrain, a physician and surgeon, who seems to have had rather thorough training, and who gave Captain Clark a short course in medicine and surgery. He also gave the group a thermometer; not a clinical thermometer, however.

Clark's first attempt to practice his new profession was apparently rather disastrous. Sergeant Floyd became very ill with what is spelled in the records as "Biliose Chorlick," I suppose meaning bilious colic. There is no record of symptoms or of treatment, but the sergeant died in about twenty-four hours, and was buried at what is now Sioux City, Iowa, where the Floyd River is named for him.

Soon after this Captain Lewis was obliged to take a "dost of salts" to work off the effects of what he believed to be arsenic, which he had gotten tasting some minerals in a bluff. Four days later, it seems Captain Lewis was in a rather debilitated state from the precautions he had taken to prevent the effects of the poison he had tasted. He had to rest several hours before venturing into the boat. It is evident that he had taken an overdose of salts rather than a dose.

At Fort Pierre there seems to have been somewhat of a jamboree, a two-day dog feast, and a dance, and carousal, and on the last day of this festival the *Journal* reads "All in Spirits this evening." Captain Clark evidently had great respect for the cup that cheers, because he spelled it with a capital S.

The sentence opening the next day's account reads "I rose early after a bad night's sleep." The cup that cheers evidently in those days acted similarly to our modern spirits.

A little later he says again "I am very unwell from the loss of sleep." Another twice-told tale. As it sometimes happens in modern times, however, a good spree seemed to straighten out the party's physical ills for some time—thinned out the blood, as it were.

In the light of our modern mild epidemics, or what seem to be epidemics, of stiff neck, one record is especially interesting. On October 22nd, Clark described an attack which he himself had. "Last night at one o'clock I was violently suddenly attacked with rheumatism in the neck, which was so violent I could not move." Captain Lewis applied a hot stone wrapped (spelled raped) in flannel, which "gave me some temporary ease." That day he made twelve miles against a high cold wind; his

neck was very painful. The next day the complaint seemed to become more or less epidemic, for Reub Fields had rheumatism in his neck, and Pierre Cruzatte was troubled with the same complaint.

November 21st, an Indian woman came, bringing in as much corn as she could carry, and a child suffering with an abscess to be treated.

On the 5th of January an Indian boy came with his feet "frosed." Two weeks later, amputation of the toes of one foot was done.

On February 11th, while Captain Clark was away hunting, Captain Lewis was compelled to officiate at the first obstetrical case, when Sacajawea (wife of Charboneau), a woman afterwards to become a very famous American, was in labor. She was probably not more than fifteen or sixteen years old, and her labor was prolonged for two hours, and was very painful. The French interpreter told Lewis that if he would administer a small portion of the rattle of a snake it would hasten the birth. Lewis pulverized a bit of the rattle between his fingers and gave it with a little water, and according to the record the delivery was completed in ten minutes.

The history of Sacajawea's later illness was very interesting, but space will not allow the record in full. Captain Lewis during this illness seems to have taken a very active hand, and her illness gave him much concern, as much for her own sake as for the fact that she was their only dependent for negotiations with the Snake Indians. Lewis believed that her disorder originated from obstruction to the menses from cold. He used a local sulfur spring water which he found and gave her bark, apparently cinchona, and opium. After she was fairly well, she ventured out and ate a considerable quantity of white apple, which was probably Indian turnip, and had quite a relapse, but the two captains apparently handled this somewhat critical case with a good deal of common sense.

They even practiced upon themselves. One day, Lewis states in the record, he was taken with such violent pain in the intestines that he was unable to eat.

"My pain still increased and toward evening, finding myself unable to march, I determined to prepare a camp of some willow boughs and remain all night."

It must be remembered that at this time he was away from camp, and had no medicine with him, so he resolved to try an experiment. The choke cherry which grew in the bottom first struck his attention.

To continue his narrative—"I directed a portion of the small twigs to be gathered, stripped of their leaves, cut into pieces about two inches long, and boiled in water until a strong black decoction of an astringent taste was produced. I took a pint of this decoction and about an hour after repeated the dose. By ten in the evening I was entirely relieved of pain, and in fact every symptom of the disorder foresook me. My fever abated and a gentle perspiration was produced and I had a comfortable and refreshing night's rest."

There are so many interesting bits in the record; but it is entirely impossible to even begin to quote them all.

On the return trip, after Lewis and Clark had separated, Lewis came down the Missouri by the route they had gone out, while Clark cut down the headwaters of the Yellowstone. Lewis went out hunting with one of the French watermen—Cruzatte—who accidentally shot Lewis in the left thigh about an inch below the hip joint, the ball going through the left thigh and over into the right, but missing the bone. Lewis describes the accident as follows: "I instantly supposed that Cruzatte had shot me in mistake for an elk, as I was dressed in brown leather and he cannot see very well. I called out to him 'damn you, you have shot me,' and I got back to the perogue as well as I could with the assistance of Sergeant Gass, I took off my clothes and dressed my wounds as well as I could, introducing tents of patent lint into the ball hole. The wounds 'blead' considerably, and I was 'happy' to find that it had touched neither bone nor artery."

After Clark and Lewis were re-united at their meeting place, Clark's record follows the surgical care of Captain Lewis.

"August 23, 1806, my *Frend* Captain Lewis is recovering fast. the hole in his thigh where the Ball passed out is closed and appears to be nearly well, the one where the ball entered discharges very well.

"Aug. 26, 1806. Cap. L. is Still on the mending hand he walks a little. I have discontinued the tent in the hole where the ball entered agreeable to his request. He tells me that he is fully convinced that the wound is sufficiently *heeled* for the tents to be discontinued. we made sixty miles today with the wind ahead greater part of day.

"Aug. 27, 1806, my freind Captain Lewis hurt himself very much by taking a longer walk on the sand bar in my absence at the Buffalo than he had strength to undergo, which caused him to remain very unwell all night.

"Aug. 30, 1806, Captain Lewis is mending slowly."

To follow the record a bit further at this time is of interest as regards the apparent incidence of malaria. It is probable that some of the men who had had malaria in the East before coming to this country had acute exacerbations, even in this altitude and climate, as some of our people still do.

September 3, 1806, Clark writes: "A trader from the house of Dickson and Co. of 'Prarie de Chian'. This Gentleman received both Cap. Lewis and myself with every mark of friendship—he was himself at the time with a chill of agu on him which he had for several days.

"Sept. 4, 1806. The mosquitos became troublesome early this morning."

There is one interesting note in the record about the Recares. Clark records that they never used spirituous liquors.

"M. Tibeau informed me that on certain occasion he offered one of their considerable men a drink of *sperits* telling him its values the other replied that he had been informed of its effects and did not like to make a fool of himself unless paid to do so, that if Mr. T. wished to laugh at him and would give him a knife or breech 'coloth' or something of that kind he would take a glass but not otherwise."

Unfortunately most of the Indians were not so constituted.

Clark describes the use of yellow root for sore eyes.

"This complaint is common. it is a violent inflammation of the eyes, attended with high fevers and headach, and is extremely distressing and frequently attended with the loss of sight. This root affords a *speedy* and *efficacious* remedy, prepared and used in the following manner: let the roots be *geathered* and washed and carefully dried in the shade, *brake* them in pieces of half an inch in length and put them in a bottle or *viol*, taking care to fill the vessel about two-thirds full of the dried root, then fill the vessel with *could* water, rain water is preferable, let it remain about six hours shaking it occasionally and it will be fit for use. the water must remain with the root and be *applied* to the eyes frequently by *wetng* a piece of fine linen and touching them gently with it. this root is a fine 'arromatic' bitter and a strong astringent."

It is interesting to speculate whether these cases of sore eyes might have been the acute stages of trachoma, although I have been unable to find in the records whether trachoma was at that time prevalent among the northwest Indians.

On September 19, 1806, Lewis makes reference to a disorder of the eyes among his own men.

"A very singular disorder is taking place amongst our party, that of sore eyes, three of the party have their eyes inflamed and *Sweled* in Such a manner as to render them *extreamly* *painfull*, particularly when exposed to the light, the eyeball is much inflamed and the lid appears burned with the Sun, the cause of this complaint of the eye I can't account for from its sudden appearance, I am willing to believe it may be owing to the reflection of the sun on the water."

In the other records of Lewis and Clark's observations of Indian treatment, mention is made of the Indian sweat-bath, which seemed to be more or less common to all the western Indian tribes; it was especially used, I believe, by the Crows. They would dig a hole two or three feet deep near a stream and cover the bottom with rocks, which they would heat either before being put into the hole, or by a fire in the hole itself. Around this hole they would build a tent of animal skins, and the patient would get into the tent and create steam by pouring water on the rocks. After getting a thorough sweat he would rush from there and jump into the icy water of the stream; then back again for another sweat; then again to the water.

It seems that the Indians used this treatment for any and all diseases, and it is recorded that when the smallpox hit the Mandans, they still persisted in using this treatment and killed many smallpox sufferers.

Lewis and Clark speak of this bath as being used at the head waters of the Columbia in 1806. Although Clark had little faith in the treatment, he used it for one of his men who had evidently a rheumatic condition in the back, and could not walk. He records that the man was well in the course of a few days—probably in spite of the treatment.

After Lewis and Clark's expedition, the first medical work by white men was of course done by the Jesuits, who came as missionaries. Father Anthony Ravalli's name stands out in the early history of Western Montana. He was born in Ferrara, Italy, May 16, 1812; entered the Society of Jesus in 1827, and after his education took his final vows April 21, 1844, while on his way to the Rocky Mountains. Because he planned on Indian missionary work during the first years of his religious life, he sought to learn those things in every field which would make him most efficient in missionary life, so the study of medicine was added to that of philosophy and theology. In company with Father De Smet, he arrived in the Oregon Territory in August, 1844. In September, 1845, he went to Colville, and a month later was recalled to St. Mary's. After he had again returned to Colville, news was brought to him one day that an Indian woman had quarreled with her husband, and becoming tired of life, had hanged herself to a nearby tree with a lariat. Father Ravalli hurried to the spot, cut the lariat, and quickly freed the woman's neck, which upon examination he found unbroken. Although the body was still warm, pulsation at the wrist and heart had entirely ceased, and to all appearance life was extinct. All this according to the legends which have grown up around Father Ravalli's life. He stretched the woman on the ground and began to breathe into her mouth, and also to move her arms up and down, so as to impart artificially to her lungs the movements of natural respiration. He kept working in this manner for about three-quarters of an hour. Then there appeared a slight change, a mere suspicion of color appeared in the lips and face of the woman. Encouraged by this sign he continued his endeavors, and soon after, clear indications of returning life became noticeable. A little while later the woman, to the astonishment of everybody, commenced to breathe very faintly at first, then more freely and regularly. Finally she opened her eyes and was soon on her feet and walking about. She lived to be an old woman.

This unusual occurrence won for Father Ravalli among Indians near and far the name of the greatest medicine man that ever lived, and well it might, if it were true. We must have our suspicions that if the heart had entirely ceased beating, artificial respiration would not have done much good. However, his reputation went through all the Territory.

He left Montana Territory in 1860, returning in 1863, when the miners were coming into the Territory from

all directions. There were very few physicians in the mountains, and Father Ravalli found much use for his medical knowledge and skill while at St. Peter's Mission at Hellgate, near the present site of Missoula, and at St. Mary's. As long as he was able to move about, he went from place to place as much a physician as a priest. He went to alleviate suffering, irrespective of race, condition, or creed, and with no preference except for such as were poorest or the greatest sufferers. Even after he himself fell ill at the Foley Ranch, a few miles from the present site of Missoula, he rallied and did more or less medical work almost to his dying day.

He is described as having been tall and portly. His well-built frame, broad forehead, prominent Roman nose, and sharp features, all combined to render his appearance peculiarly impressive. He died at St. Mary's on October 2, 1884.

With one more bit I shall stop the narrative, which I hope may be picked up and carried on through the later medical history of Montana.

And this note regards Dr. James E. Stuart, the first physician and surgeon, except for Father Ravalli, to practice in what is now known as Montana. I am indebted for the information as regards his medical life to his nephew, the late Dr. James E. Stuart,* of Livingston, Montana; to his brother Granville Stuart's *Forty Years on the Frontier*; and to *Memoirs of the Life of James Stuart* by Granville Stuart in Volume 1 of the Montana State Historical Society publications.

James Stuart was born in Virginia in 1832. During October, 1857, with his brother Granville and a very small party, he first came into Montana over the Monida Divide. The party had been stranded in Utah on their way East from California due to the belligerent antics of the Mormons, and finding it impossible to go either East or West, they came North.

Granville Stuart writes of his brother's education, saying that he received the rudiments of education at home from his father and mother, supplemented by an occasional three months' term in a backwoods school, and completed by a twelve months' course in 1847 and 1848 in a high school at Iowa City. In 1862 he sent East from Montana and procured a number of medical works and instruments and a small stock of medicine; and applied himself assiduously to the study of medicine and surgery. He had read medicine under a physician in his youth and also attended a course or two of medical lectures. He continued to study medicine during the rest of his life, and at the time of his death had a good medical library and the latest medical and surgical equipment. He was said to be one of the best-read physicians in Montana. He never practiced, however, except among his friends and associates, many of whom owed their lives to his skill. His brother further relates that he never accepted even the slightest compensation for his medical service to anyone. It appears that he was not generally known as Dr. Stuart, and did not want the title, although he was known throughout the territory

* Died, January 4, 1938.

to possess great medical and surgical skill. When regular practitioners were not at hand, he administered widely to the sick and injured.

Mr. Paul C. Phillips, of the University of Montana, who edited Granville Stuart's *Forty Years on the Frontier*, describes James Stuart as a man of action, an aggressive gold-seeker who managed his mercantile business with daring skill. He was the first sheriff of a Montana county and a desperate fighter of criminals. He led the Yellowstone Expedition of 1863, and was active in the search of a direct route from the East to Montana.

"He was a man of tremendous energy, violent impulses, and only an early death cut short a career that promised to be brilliant."

It is related that during the Yellowstone Expedition of 1863 the men were ambushed at night by a band of Crows; several white men were killed and several badly wounded before daylight drove the Indians beyond rifle range.

Samuel T. Hauser, who was a member of the expedition, writes of the affair as follows: "Before going out, Gerry, Underwood, and myself, who belonged to the fraternity (meaning I suppose the Masonic Fraternity), had a little side talk, which resulted in each one declaring that if he was mortally wounded, he would reserve one shot that would prevent unnecessary sacrifice of the party by remaining to defend the man who must die anyway, also to prevent torture if captured. In order to ascertain whether we were mortally wounded, we agreed to have Jim (meaning James Stuart) examine and decide."

It appeared that several more lives would have been lost during this expedition had it not been for James Stuart's surgical skill. When it is considered that his surgical work was done with only some opium and whiskey to ease the suffering, and in a wilderness with no conveniences, we must find admiration in our hearts for the man who carried on his medical avocation with so much perseverance and skill.

Dr. James Stuart's pocket surgical kit was in the possession of his nephew, the late Dr. James Stuart, of Livingston. Dr. Stuart described the instruments of the ancient folding type, with real tortoise shell handles. He said that the blades were as bright and sharp today as they were when made, although they showed the effects of having been sharpened. They are of British make. His caustic-holder still retains a small stick of silver nitrate. An unfinished Masonic emblem, in the form of a keystone of solid aluminum, was with the pocket surgical kit when Dr. Stuart received it. This he presented to the Masonic lodge in Deer Lodge.

Dr. Stuart died at Fort Peck, Montana, on September 30, 1873. He diagnosed his own disease as "organic disease of the liver." He was buried with Masonic rites in the little cemetery just west of Deer Lodge on November 12, 1873. His body could not be brought to Deer Lodge any faster with the slow transportation of those days.

The history of the physicians who practiced in Montana during the stirring early sixties, when Bannack and Virginia City were being settled, must go on to another time, but we do hope and know that it will be gotten together from the records and preserved for the younger men who will be coming as time goes on to take our place in Montana medicine.

Bone Marrow Studies*

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SOME very perplexing diagnostic problems occur among the anemias, the leukoses, and related illnesses. Many offer few early signs; often, with every laboratory aid (including direct marrow studies), the course of the disease and its final issue should be known before an accurate determination is ventured. Indeed, the final autopsy may fail occasionally to clear up all the confusion. Where such a situation exists and frequently recurs, new methods of study that appear promising augment the medical literature dealing therewith. This likely explains the current flow of timely articles dealing with "diseases of the blood." As to that portion dealing specifically with bone marrow biopsies,

the question arises in the minds of many clinicians whether qualified examiners may not secure as convincing information from the repeated study of smears from the circulating blood in hematopoietic disturbances, as where marrow biopsies are utilized. It is not my purpose to venture any portion of an answer to that implied demand for an immediate and complete evaluation. Patience is still a virtue.

The number of researchers in the field of marrow study bids fair to provide the limits and indications where coincidental blood and marrow cell studies complement each other; and especially in acute fulminant breaks in marrow physiology, where a prognosis is even more essential than a diagnosis, the marrow may yield decisive evidence where blood smears are only dubiously suggestive. As in all medical research, the gleanings of cloistered

* Excerpted and adapted from an address before the North Dakota State Medical Association meeting, Grand Forks, North Dakota, May 2, 1937.

† From the department of medicine, the Duluth Clinic, Duluth, Minnesota.

researchers must be tested out, simplified, and made routine by clinicians sympathetic towards research, but retaining their sense of direction and capacity for correlation.

Any technical laboratory qualified to interpret blood smears may soon become equal to the necessary differentiations in hyperplastic or "overfilled" marrow. Sternal marrow smears, especially with the aspiration technique, are little more disconcerting to the patient than venipuncture. Aside from their practical help in diagnosis, marrow studies offer a fruitful field for experience in the study of developing and maturing blood elements. Nowhere else may one see juxtaposed and simultaneously-stained such a variety of forms. The preliminary confusion that arises, for example, in the hyperplastic marrow of untreated "pernicious anemia,"¹² may become a beacon in the dark, because it is true that the earlier forms of both erythrocytes and leukocytes may not be easily distinguished. However, the clinician is not tied to any isolated approach. In this particular instance he has available the results of a few days' administration of parenteral liver maturation factor, and as if by magic the marrow picture is all changed. This would not occur in any acute leukosis. He may be assured that he has seen and identified some of the earliest blood cells. These cell forms and their staining reactions gradually become familiar.* Most clinicians make no pretense of being hematologists. We are called upon to familiarize ourselves not only with the anemias and the leukoses, but various hemorrhagic states where the blood platelets fail; ulcerative mucocutaneous areas where the granular leukocytes tend to disappear from the circulating blood; and a multitude of overlapping circumstances where associated fever, splenomegaly, hepatomegaly, jaundice, general or regional adenopathies . . . all arise with possible perversions of bone marrow physiology. The marrow produces the red cells, the polynuclear leukocytes, its share of the lymphocytes, and the thrombocytes or platelets. Normal oxygenation, metabolism and bodily defense against infection or hemorrhage are jeopardized when these vital products fail to attain the circulating blood in orderly sequence. Physiologists have acquired an appreciation of the marrow, in strong historical contrast to the contempt of Virchow—that it indifferently filled the spaces in hollow and cancellous bone! A good deal of present interest stems from the discovery of maturation substances (liver and ventriculin) and their general use.

The Literature and Technical Guidance

Marrow study is well written-up in the American literature. I shall enumerate some articles readily available. Then I shall sketchily report some of the experiences we have had, where, with our clinic laboratory and those of our Duluth hospitals, we have attempted to correlate the clinical, the laboratory and the pathological findings.

* We have been successful in using kodachrome film, in a Leica camera, for photomicrography. Up to date only projection is possible. For small seminar groups the method is very good. An artist's concept of what a microscopist sees is often something bizarre.

Gillespie¹ and Tuohy (April, 1935) reported upon a modified Seyfarth trephine. It is easy with various trephines to secure a plug from which touch imprints are made, and fixed tissue sections may be made as well, to get topographic alignments.

Dameshek² (1935) in an article "Progress in Haematology" gave a review which mentioned bone marrow studies and their possible advantages, and referred to the detailed work of the Scandinavian authors, Nordenson³ and Segerdahl.⁴

Dameshek,⁵ Henstell and Valentine, have followed (November, 1937) with a critical review, contrasting the advantages of simple needling of the sternal marrow with that of trephine plugs. Sufficient detail is published, with some good photomicrographic illustrations, to be very helpful, especially for interpreting the leukopenic leukoses.

Forker⁶ (October, 1937) summarized in a timely manner the extremely complicating feature of classification and terminology. While he does not discuss direct marrow study in any detail, there is a great deal in his article to help the clinician towards a basic understanding.

Mettier⁷ and Purviance (September, 1937) re-emphasized the scrutiny necessary to avoid overlooking the various types of leukoses where low counts (leukopenia) obtain. Dameshek states that in recent years 50 per cent of the acute leukoses observed fall into this category. Watkins'⁸ experience at the Mayo Clinic is similar.

The perturbing question of normal standards* is in-

* Nordenson published (from 47 cases studied) the schedule of cells enumerated in this table as normal.

	Per Cent		Per Cent
Myeloblasts	0.25—5	Stab forms	1.0—10
Promyelocytes	1.0—8	Mat. Neutrophiles	4.0—35
Myelocytes	3.0—24	Mat. Eosinophiles	0.25—7
Metamyelocytes	12.0—42	Mat. Basophiles	0—7.5
Pronormoblasts	0—6	Lymphocytes	7.0—38
Basophile "	1—16	Monocytes	0—5
Normoblasts	26—184	Plasma cells	0—3
		Ferrata cells	3—31

Note: We have been unable to identify or recognize Ferrata cells. Different authors vary considerably in their statements as to the relative proportion of marrow leukocytes and nucleated red cells. Dameshek states that the ratio of Rbc. to Wbc. is 1:1 with trephine approach and 0.5:1 with puncture.

deed an obstacle, especially where minor marrow count deviations are found. Short wave radiation, chemical poisons, disease toxins, perverted metabolism or systemic disease. There remain research problems for special students. Osgood and Young⁹ (1935) gave the results of needle aspiration in normal subjects. Recently, a popular pharmaceutical firm has published in a series of brochures some material and plates from Osgood's¹⁰ book. Since translating Nordenson's³ article from *Hygea* (1934) we have followed his technique as closely as possible, in order, within limitations, to test out and repeat his work. We have found both for normals and abnormals (despite certain nomenclature hurdles) that our figures quite coincide with his. Nordenson counted 400 cells (leukocyte series) and enumerated the number of nucleated red cells seen while doing so. The process is laborious; and for practical purposes and where great packing of the marrow spaces exists, sufficient information is secured by a general view of the microscop-

field, noting the morphology of the individual cells as one adjudges a section of malignant tissue. Norden-son advised in sternal marrow needling to use the gentlest suction, to "fill the needle until the contents begin to appear in the barrel of the syringe." Thus is avoided the blood contamination that makes, when excessive, the marrow and blood smears almost identical. Four or five slide smears are made from the needle contents, and stained with Wright's* stain.

The Advantage of Marrow Studies

The term "leukemia" while inaccurate and misleading (like many other familiar terms in medicine), has been in use so long that no doubt it will survive. Nomenclature** defects are never easy to correct. In the field of hematology names are very confusing: witness the present attempt to find a satisfactory name for what has so long been called "pernicious anemia." For the present I propose briefly to excerpt some case experiences, dealing chiefly with the leukopenias; and with each I shall merge a discussion of the clinical course, with some individual problems of marrow interpretation. In such manner I hope to illustrate a segment of the field where marrow and blood studies are certainly complementary.

Case I.

In March, 1930, a woman (Mrs. C. J. H., *aet.* 42) came to the Duluth Clinic with the story of an acute upper respiratory infection, which was promptly followed by weakness, dyspnea, increasing pallor, and edema of the ankles. The entire decline from that of excellent health had occurred in five weeks' time. A long series of blood studies followed over a period of two months, culminating in a splenectomy upon the basis of a supposed "thrombocytopenic purpura." She made an immediate and very favorable response: all abnormal bleeding stopped, the platelets returned to normal, and there was a decided improvement in the erythrocyte count, whereas previously only transfusions had given temporary benefit. However, the leukopenia yielded very shortly to a leukocytosis, and an obvious myelocytic leukosis. Death came within six months of our first observation.

I feel sure that had we had our present marrow study facilities, we would not have been deceived by the hemorrhagic tendencies; and we would have scrutinized more keenly the drop in erythrocytes apart from that attributable to blood loss; such items as the leukocyte differential count and especially the general marrow depression (platelets included) would have weighed more heavily with us than did the "failure of clot retraction." Watkins⁸ states that close attention and analysis of such cases with overlapping symptoms accounts for bringing more of them to light. We have, for example, found within eighteen months eight leukopenic leukoses of varying types.

Case II.

Mrs. J. E. O., *aet.* 40, developed a severe low back-ache, and later vaginal ulceration. After local treatment

* 2-minute Wright stain; set 5 minutes with distilled water—then wash with the same.

** Crane, E. J.: Words and Sentences in Science and Industry, Science 86, 549 (Dec. 17), 1937.

for about six weeks, she came to Duluth from her home in Northern Wisconsin. A general review showed a patient considerably more ill and prostrated than appeared immediately explainable from the presenting local lesions. Considerable local cauterization had been done. The convincing explanation and basis for her illness came, however, when despite a leukocyte count of 10,600, a differential count showed a few myeloblasts; and a sternal bone plug (used at that time) showed a marrow with marked myeloid hyperplasia and an overwhelming predominance of stem cells. This lent us an immediate and unequivocal diagnosis. Whereas it was a great shock to the family, the prognosis, based upon these findings, was correct. She died within a few weeks. Hemorrhages appeared late; the pathologist found leukemic infiltration in the usual sites—liver and spleen.

Comment: Had this autopsy been done without a reasonably careful blood review, or with the simple notation that the leukocytes were within normal limits, this case might have been recorded as "an aleukemic leukemia." Accumulating experience casts doubt upon the legitimacy of this appellation when occasionally used without the qualifications here implied. So far as I can cull from our own past records, it connotes the infiltration the pathologist found in the tissues (best illustrated in the liver and spleen, but often almost universal), and the clinical laboratory record has usually been so incomplete as to be of dubious value. It is, however, theoretically possible that a leukemia might be "aleukemic" throughout its course. The evidence accumulates conversely that from time to time "showers of abnormal cells" attain the circulation, to use Watkins's expression.

Case III—Acute Myelogenous Leukosis

Mrs. C. A. J.,* *aet.* 40. She had had a cholecystectomy two years previously. Her present illness followed immediately upon the excision of a thrombotic hemorrhoid—a very simple proceeding. The area did not heal. The anal area became necrotic within ten days' time, and she died two days later. At autopsy there was leukemic infiltration of the liver and spleen. The evidence of hyperplastic marrow as seen in Table 1 was

Table 1** (Case III)

<i>Blood Count</i>		<i>Differential Count</i>	
Hgb. 8 gms.		<i>Marrow</i>	<i>Blood</i>
Rbc. 2,700,000		58	Myeloblasts
Wbc. 2,100		22	Promyelocytes
		3.5	Myelocytes
		3.5	Metamyelocytes
		4.0	Non-segmented Pmn.
			E. Pmn.
		6.0	Lymphocytes
		1.0	Monocytes
		1.0	Plasma cells*
		4.0	Retic. cells
		61	Normoblasts
		11	B. Normoblasts
		4	Pronormoblasts

* I am indebted to Dr. Frank J. Elias of Duluth for permission to include this case, seen in consultation.

** These tables and counts have been checked by my associate, Dr. W. D. Coventry, to whom I am indebted. To abridge and conserve space some of the intermediary sub-forms are left out in all the tables, and such cells are grouped in the closest adjacent category.

also confirmed. Note the relatively normal leukocyte count as to the total count, but it is evident that the myeloid marrow hyperplasia was crowding out the red cells.

Case IV—Acute Myelogenous Leukosis

Mrs. G. W., *aet.* 40, is about a replica of Case III except for minor variations. She had had a hemorrhoidectomy (elsewhere) three months previously, and a non-healing ulcer remained. Thrombophlebitis, with swelling of both legs, followed, and with remittent fever. She lived but three weeks after the myelogenous leukosis was diagnosed. Table 2 here indicated a lesser intrusion upon erythropoiesis. In fact, there was some stimulation, as shown in the nucleated reds.

Table 2 (Case IV)

Blood Count	Marrow	Differential Count	Blood
Hgb. 6 gms.			
Rbc. 2,050,000	90	Lymphoblast (stem cells)	59
Wbc. 2,100	5	Promyelocytes	
		Non-segmented Pmn.	10
		Segmented Pmn.	2
	5	Lymphocytes	29

* Reiter, B. R., and Freeman, J. T.: Plasma Cell Leukaemia. *Am. J. Med. Sci.* 193:28 (Jan.), 1937—report an overgrowth of this normally rare cell. Thus there are numerous possible cell leukemic types.

Case V.

J. K., female, *aet.* 45. Usually well and strong. She had had a cholecystectomy for gall stones three years previously. She consulted Dr. Edward Addy, of Gilbert, Minnesota, for a developing pallor and weakness, without weight-loss or localizing evidence of any special disease. The doctor found both a leukopenia and anemia and gave liver extract orally for six weeks without improving her status. He referred her to the Duluth Clinic for a review, and Table 3 reveals the situation that obtained. A very grave prognosis was given. Her death, despite transfusions, within five weeks, confirmed what the bone marrow so obviously connoted.

Table 3 (Case V)

Blood Count	Marrow	Differential Count	Blood
Hgb. 7.5 gms.			
Rbc. 2,300,000	100	Lymphoblasts (stem cells)	75
Wbc. 20,000		Promyelocytes	7
Platelets 42,000		N. Myelocytes	1.0
		Metamyelocytes	2.0
		Adult Pmn.	3.0
		Lymphocytes	12.0

Comment: Cases III, IV and V are fully representative of this group, and I shall list no more. These are in no way different from routine "acute leukemias." No one should now call these "aleukemic," simply because the leukocyte counts are near or below the average normal. Whether the primitive cell-form is myeloblastic or lymphoblastic makes no essential difference. They have much the same symptomatology and die *via* the same routes. The spleen and lymph glands are often not enlarged at any stage of their course, as Mettier⁷ and Purviance well establish in their report. In none of these did the marrow smears alone make the diagnosis. Nevertheless, the findings lent certainty early, and the basis for unequivocal prognoses.

Case VI—Acute Lymphoblastic Leukosis

R. R., male *aet.* 15. He was sent from an adjoining county with a diagnosis of a possible poliomyelitis because of neck rigidity, photophobia, bladder paralysis, and lack of control of legs. At the preliminary neurological examination he had bilateral ankle clonus and a positive Babinski, without any sensory disturbance. Blood (apparently old) was found in the spinal fluid. However, the attention shifted promptly away from the central nervous system to the marrow output when it was noticed that he had repeated nose bleeds, but showed no blood in urine or feces. Within a few minutes, a sternal puncture gave such evidence as is seen in Table 4.

We have seen platelet counts repeatedly much lower than found here, without any tendency to bleed. This boy had, however, in the six weeks he lived, a climbing leukocyte count, and we never saw him with a leukopenia. There would appear to be some factor precipitating hemorrhage when large numbers of immature cells flood the circulation.

Table 4 (Case VI)

Blood Count	Marrow	Differential Count	Blood
Hgb. 6 gms.			
Rbc. 2,380,000	81	Myeloblasts	85
Wbc. 1,650	6	Promyelocytes	5
Platelets:	4	N. Myelocytes	5
"Very few seen"		Metamyelocytes	2
	6	Non-segmented Pmn.	0
	0	Segmented Pmn.	
		Lymphocytes	2
		Eosin. Pmn.	1
	11	Normoblasts	43

Case VII—Severe Marrow Depression Cause Unknown—Pemphigus

Mrs. P. F., *aet.* 61. Very acutely ill. Was brought to St. Mary's Hospital, December 20, 1935. She had been in an automobile collision, with resultant back and hip disability after July 20, 1935. While in bed she had taken certain pain-relieving medication, the nature of which we could never find out. She had developed about August 10, 1935, after an indefinite scratch on the right upper arm, a local lesion that did not heal. Certain other small skin lesions developed, which upon opening drained a serosanguinous material, and soon thereafter she developed perirectal inflammation. When we saw her she had rapidly developed, generally over the body, bullous blebs. Those that had broken previously showed a gangrenous area underneath; and the rectal area developed large sloughs. At no time did she show any throat ulceration.

We found that she not only had a very low leukocyte count, but the red cells and platelets were greatly depressed, as shown in Table 5. Her temperature ranged very high. Pentnucleotide was given, ill-advisedly, and blood transfusions were ineffectual. At postmortem, the bone marrow was "edematous and hypoplastic."

Comment: I introduce this case to illustrate a marked bone marrow depression. In such an "empty" state, needling is insufficient; a sternal plug is necessary. It is certain that she did not have the clinical entity of agranulocytosis (granulocytopenic angina—Jackson, Schulz,

Table 5 (Case VII)

Blood Count	Marrow	Differential Count	Blood
Hgb. 13 gms.			
Rbc. 4,500,000	3.0	Myeloblasts	3
Wbc. 13,200	6.0	Promyelocytes	
	36	N. Myelocytes	18
	19	Metamyelocytes	59
	6	Non-segmented Pmn.	15
	2	Segmented Pmn.	
	28	Lymphocytes	5
	200	Normoblasts	
	2	B. Normoblasts	
	4	Pronormoblasts	

Kracke, Madison and Squier), since there was such accompanying depression of both the red cells and the platelets. It was easy to recognize, however, the same type of prostration, and the tendency to rectal sloughing (an area with rich bacterial flora), as seen where the depression is isolatedly granulocytopenic. It is likely that we have been too ready in the recent past to make that latter diagnosis.

Judging isolatedly the nature of the marrow cells, one might easily be led to imply that the reversion to a dominance of myeloblasts far out of proportion to the normal indicated a leukemic background. On the other hand, simply counting four hundred nucleated white cells in marrow smears gives no complete appraisal of volume output. In that sense, counts of blood and marrow have one decided quantitative difference, since total blood volume varies within such narrow limits. Isaacs' ¹¹ elaborate counting method in no way disposes of that issue, and fixed tissue sections, as frequently advised, may help.

In this instance the pathologist (Dr. George L. Berdez) gave his ultimate verdict as aplastic anemia* and pemphigoid lesions of the skin.

Pathologists are distinctly within their rights when they take a stand as to what their terminal findings show, but these do not always chronicle the route or sequence of invasion or decline. Adjustment among observers is essential in conformity with what the *course of disease* dictates. Every specialty in medicine has a special pathology; and the general tissue pathologist may well look to the specialist for coöperation to the end that the dynamics of perverted physiology may, like the course of a vessel, be charted. With this background in mind, I do not think we are in a position to make a decisive etiological diagnosis in this case. As yet we are not aware of all of the factors, known or unknown, metabolic or toxic, which may on occasion repress the marrow; and in which state primitive regeneration may be the only effort possible. There is a decided difference between an experimental "malignancy" which proceeds to a certain point of unrestrained neoplasia, but later accepts biometrical restriction. This woman did not live long enough to permit such a demonstration. There was no opportunity to permit the "disease course"

* This diagnosis, like granulocytopenic angina, should be made only after the closest scrutiny. Ruling out the known marrow depressants, including generalized metastases or marrow cancer, Albers-Schönberg's disease, etc., the so-called "spontaneous marrow depressions" are very apt to be one of the leukoses. As to the dermatological changes that may occur with marrow perversions, this is a large subject, concerning which there is a voluminous literature. Little is known about the etiology of pemphigus.

to add its diagnostic weight. Some cases of "aplastic anemia" of known chemical etiology have recovered after many consecutive transfusions. Frequent marrow studies in such instances would be enlightening.

Case VIII—Chronic Infectious Arthritis; Terminal Myelogenous Leukosis; "Leukemoid" Reaction; Staphylococci Pyemia

Mrs. J. L., female, *aet.* 29. This patient was observed from time to time for ten years, suffering with a perverse chronic arthritis. Clawson and Wetherby's vaccine had been used considerably. She alleged "the reactions were usually quite severe." Her last three months of life were a torment with (in retrospect) an obviously pyemic temperature, with profuse sweats. Had she had cardiac murmurs, a diagnosis of subacute bacterial endocarditis would have been strongly considered. There was a suspicion of moderate enlargement of the spleen; a few red blood cells were found in the urine. Blood cultures were repeatedly negative. During her long, chronic illness, she had, for the most part, a leukopenia. In the last six weeks of her life, the laboratory reports began to show myelocytes, then a few myeloblasts. Table 6 shows comparative counts of blood and marrow at about the time of this leukemic shift. The reversion was sufficient to cause two hematologists, internationally known, to acclaim the picture that of "myeloid leukosis." The gross liver diagnosis at autopsy was "leukemic infiltration;" but on microscopical section the "whitish yellow areas" were seen to be "masses of staphylococci!"

Table 6 (Case VIII)

Blood Count	Marrow	Differential Count	Blood
Hgb. 7 gms.			
Rbc. 2,680,000	48	Myeloblasts	1
Wbc. 3,000	3	Promyelocytes	
	10	Metamyelocytes	1
	6	Non-segmented Pmn.	31
	1	Adult Pmn.	11
	2	Monocytes	9
	28	Lymphocytes	47
	2	Plasma cells	
	2	Promegaloblasts(?)	
	5	Pronormoblasts	
	12	B. Normoblasts	
	32	Normoblasts	

Comment: This patient had a staphylococcemia long before she had "a leukemic shift." It caused her death. The leukemic features may be none the less real because of this; but I incline to the opinion that this illustrates to what degree a marrow reversion may go in proven infection. Notice also that the major marrow cell development was not at the "malignant" stem cell level, but at the metamyelocyte zone.

Case IX—Aleukemic Myelogenous Leukosis

F. J. D., male, *aet.* 59. He was advised to have his blood examined by friends who noted decisive pallor. It apparently had been developing for seven months. A plethoric type, he had lost no weight and looked like a possible "pernicious anemia." The earliest blood smears showed some macrocytosis. While searching meticulously for obscure hemorrhage (X-rays of gastro-intestinal tract, etc.), massive doses of parenteral liver made no change

whatever in his red cell count, but never thereafter were any macrocytes seen in his blood smears. Myxedema was ruled out. From the earliest examinations all the marrow elements were depressed: Hgb. 6 gms., Rbc. 2,040,000, Wbc. 3,200, platelets 118,000. Repeated small transfusions made no perceptible change in the counts. He was referred to the Mayo Clinic three weeks after our first tests, and there C. H. Watkins reported "occasional showers of myeloblasts" in the blood smears and made a provisional diagnosis of "myeloid leukemia." When he returned here, we submitted him to several sternal punctures and one bone plug biopsy. Table 7 shows one of the last comparative marrow and blood smear counts. The patient died without any hemorrhages, but he developed a thrombophlebitis, with a very severe and exhausting diarrhea. This terminal infection, two months after we first observed him, is akin to the bacterial death seen in agranulocytopenia: there are no fighting leukocytes for defense.

Table 7 (Case IX)

Blood Count	Marrow	Differential Count	Blood
Hgb. 6.1 gms.			
Rbc. 1,900,000	97	Myeloblasts (stem cells)	52
Wbc. 11,800		Promyelocytes	1
		Non-segmented Pmn.	1
	2	Lymphocytes	45
		Eosin. Pmn.	1
	1	Monocyte	
	2	Normoblasts	

The autopsy revealed no "leukemic infiltration," and the pathologists (a considerable group) who have seen the sections of visceral organs and marrow incline to emphasize the general marrow depression rather than regeneration; to point to the terminal infection, and its invasion, particularly of the kidney. In a word, it is not their idea of "leukemia." Nevertheless, he went on to death, with the clinical course that a subacute or sub-leukemic patient pursues, and that is my diagnosis. It seems reasonable to assume that the marrow was not active enough for its native cells to "metastasize to the viscera."

Comment: Cases VIII and IX deserve the closest scrutiny. Notice in the respective tables (6 and 7) what decisive regeneration is shown in the red cells of the marrow. Without a discussion that leads too far afield, I hope those interested may, with the aid of the current literature, weigh well these implications. We await the discovery of some comparable agency or physiological method that shall do for the leukocyte series what liver storage maturation factor does for the macrocytic anemia it so promptly relieves. It is likely that what we have called leukemia covers a group of perversions, just as macrocytosis indicates a series of physiological erythro-genic impediments, somewhat related. The necropsist was never in a position, with his terminal static findings, to unravel this puzzle. It is not to his discredit. As a clinical pathologist the way is open to study the marrow under wide variations of health and disease. Some other biological approach may give the solution, but an organ (the marrow) that masses as large in volume and as important in physiology as the liver, deserves the ut-

most in study from every possible angle. It will require a considerable period of conscientious coöperative study between tissue pathologists and clinical hematologists to reconcile their views. All I have said relative to nomenclature is only one of the confusions.

Summary

1. I have submitted a statement in partial review of the current literature dealing with bone marrow biopsy.

2. Illustrative acute cases, with comparative marrow and blood smear differential counts, are reported.

3. The study of marrow is recommended not as a routine but as an adjunct method, especially in acute hematological perversions. The prognostic values are emphasized.

4. The statement often made that for the pre-mortem diagnosis of "aleukemic leukemia" bone marrow smears are necessary must be reserved for those instances where the circulating blood smear fails at any time to show qualitative leukocytic reversion. So far we have not found such a case, although Case IX at times was a close example. The interpretation of the leukopenias calls for the closest differential studies.

5. Without expecting the direct marrow study to be all determinative, its future developments are promising. My own technical limitations in the science of hematology prompt me to hope that controversial argument over blood cell origins may abate; that the clinician may not be held to be presumptuous in adding the weight of his observations.

Note: Jones,¹² one of Professor Hal Downey's students, now at the University of Buffalo Medical School, has just now (as I have finished the preparation of this article) added to the literature an article dealing with the Pmn.'s in untreated pernicious anemia. We have seen these same "macropolycytes" in aspirated sternal marrow in a man with a severe pernicious anemia exacerbation. Undoubtedly the lack of maturation substances interferes with all marrow function.

Downey's¹³ *Handbook of Haematology* is in the process of publication, and is eagerly awaited.

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Some Diseases of the Peripheral Arteries*

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RAYNAUD'S DISEASE

RAYNAUD'S disease is a condition characterized by transient discoloration of the digits on exposure to cold or during acute emotional disturbances. The most common phase of discoloration is pallor which is ordinarily followed by cyanosis. Rubor may follow either pallor or cyanosis. The differential diagnosis is presented in Table 2.

Diagnosis

The diagnosis of Raynaud's disease is based on the following criteria: (1) intermittent attacks of changes of color of the acral parts; (2) symmetrical or bilateral involvement; (3) absence of clinical evidence of occlusive lesions of the peripheral arteries; (4) gangrene or trophic changes, if present, are limited in a large degree to a small area of skin; (5) minimal duration of two years; (6) absence of disease to which vasomotor changes could be secondary.

Pathogenesis

Uncomplicated Raynaud's disease is the result of hyperactivity of vasomotor innervation; a "local fault" of the digital arteries is an added factor in cases in which the condition is advanced.

Pathologic Physiology

During pallor the capillary loops are constricted, incompletely filled and many of them are invisible. During cyanosis, the capillary loops are dilated, the blood in them is blue and the flow in them is intermittent. During the stage of rubor, red blood flows rapidly in the capillaries and the surface temperature is high.

Etiology

This disease usually affects women (89 per cent of cases) in the second, third and fourth decades of their lives. It is ordinarily a manifestation of nervous instability.

Symptoms

Discoloration is usually a result of exposure to cold but occasionally it is the result of emotional disturbances. The commonest change in color is pallor, the next most common discoloration is cyanosis, and rubor is least common. Frequently, all digits of both sides are included in the process simultaneously but the extent of vasomotor changes frequently varies widely. Most commonly, the terminal phalanges are involved but the entire digit may be affected. The various colors of the involved parts do not follow one another uniformly. Pallor may be transformed into cyanosis in an irregular, patchy manner and may give way to rubor while pallor is still present in other acral parts. Occasionally, one may see all phases at the same time, that is, pallor, cyanosis, and

rubor in the digits of a single extremity. The digits ordinarily appear normal between episodes of discoloration in the early stage, before permanent changes have occurred. Pain is ordinarily absent although numbness is usually associated with pallor and tingling with rubor.

Complications

Scleroderma, recurrent paronychia infections and recurrent ulcerations and infections of the tips of the fingers may occur as complications of uncontrolled Raynaud's disease. Gangrene is minimal and when present is limited to small portions of the skin.

Treatment

Residence in a warm climate and freedom from nervous and mental strain may cause amelioration of symptoms in cases in which the disease is uncomplicated by scleroderma and other trophic changes. However, the most satisfactory treatment is sympathectomy which produces cure uniformly in the lower extremities. The operation is not uniformly successful in the upper extremities although recent improvements in surgical technic apparently have increased the percentage of cures from operation. Operation should not be delayed until complications occur. Whenever discoloration occurs progressively more easily, operation should be performed without delay.

ERYTHROMELALGIA*

Clinical Manifestations

Erythromelalgia is a very rare syndrome characterized by attacks of burning pain involving the hands or feet unilaterally or bilaterally and associated with actual elevation of the cutaneous temperature. The distress is ordinarily produced or aggravated by any measures which increase the temperature of the skin, such as exercise and vasodilatation, or by the application of heat directly to the extremities. It is relieved by rest, cooling and elevation of the extremities or by any measures which cause the temperature of the affected parts to decrease.

Diagnosis

Many conditions characterized by burning distress in the extremities are not examples of erythromelalgia but are instances of burning paresthesias. These occur commonly in neuritis due to ischemia, as in chronic occlusive arterial disease, or in neuritis due to heavy metals as arsenic and lead, or they may occur as a manifestation of arteriosclerosis which involves the central nervous system. In any case the clue to whether or not the condition is one of paresthesias of burning or one of erythromelalgia is the surface temperature. If unusual warmth of skin is associated with subjective burning, the condition

* A classification is given in Table I.

† Division of Medicine, the Mayo Clinic.

* Some such term as "erythrothermalgia" might be adopted to indicate warmth as well as redness and pain.

is probably erythromelalgia but if the skin is cold when there is subjective burning, the condition is not erythromelalgia. Usually, the skin temperatures can be estimated satisfactorily with the examiner's hand but occasionally thermometric studies are necessary. In questionable cases it is usually easy to prove or disprove the diagnosis of erythromelalgia as in true instances of this condition distress can be produced regularly in the extremities by provoking vasodilatation by means of a baker applied to the trunk or applying radiant heat directly to the involved extremity. When the temperature of the skin of the extremities reaches a level which is fairly constant for each individual, burning distress occurs, and when the temperature of the skin of the extremities decreases below this point, the distress disappears. This dependency of distress on temperature of the skin is absent in the many conditions of burning distress in the extremities which are not examples of erythromelalgia. The differential diagnosis is considered in Table 2.

Treatment

The condition is characterized by resistance to treatment. Local radiation with radium and roentgen rays may be of value. The inhalation of a 1:100 solution of epinephrine hydrochloride by means of a special atomizer such as is used in the treatment of asthma may terminate attacks of erythromelalgia. The exact amount needed can be determined by experience. A solution of epinephrine may also be injected subcutaneously in amounts of 0.5 cc. to 1.0 cc. of a standard 1:1000 solution. When erythromelalgia is associated with polycythemia vera, the return of the blood to a normal or nearly normal state as a result of repeated venesection or the administration of phenylhydrazine may cause disappearance of the distress. It is worth while in instances of severe distress to attempt desensitization of the skin by immersing the extremities in water, the temperature of which is gradually increased. At first, the extremities should be immersed in water at 30° C. for fifteen minutes twice daily for two or three days. The temperature of the water should then be increased one or two degrees for another period of two days, and this program should be continued. If distress occurs when the temperature of the water is that which ordinarily provokes distress, the treatment should be begun again. If this plan of treatment is successful, water at the temperature which provoked distress before the treatment was begun will not cause distress. In cases of very severe involvement it may be advisable to anesthetize the skin of the affected extremity by section, crushing, or by injection of alcohol into the peripheral nerves. For the foot, these nerves are the posterior tibial, sural, and superficial and deep peroneal. In some instances, acetylsalicylic acid seems to have an almost specific effect. Administration of as little as 5 to 10 grains (0.3 to 0.65 gm.) may relieve for as long as forty-eight hours.

SUDDEN ARTERIAL OCCLUSION

Etiology

Arteries may be occluded suddenly as a result of embolism or thrombosis. The heart is the chief source of emboli but emboli may arise in the aorta and occlude the arteries of the extremities. Thrombosis occurs in aneurysms and as a result of arteriosclerosis and thromboangiitis obliterans. Arteries may also be occluded suddenly as a result of ligation or trauma.

Symptoms

Pain occurs suddenly as a result of embolism in an extremity in only about half the instances. Numbness, coldness, tingling, pallor, and paresthesias such as burning or itching and tenderness may be additional symptoms.

Diagnosis

Sudden occlusion should be suspected when any of these symptoms occur in the extremities. The chief findings are absence of pulsations in some of the acral arteries in which pulsations were previously present, lowered surface temperature, pallor, and the loss or diminution of reflexes, sensation and muscular strength. Thrombophlebitis is the only condition which may be distinguished with difficulty from sudden arterial occlusion. Ordinarily, the normal temperature, edema, distended veins, and the normal arterial pulsations observed in cases of thrombophlebitis serve as an adequate contrast to the lowered temperature, collapsed veins and the diminution or absence of pulsations in the arteries in cases of sudden arterial occlusion. However, in thrombophlebitis, arterial pulsations may be absent temporarily as a result of spasm. Under such circumstances close attention must be given to the mode of onset and the known possibilities of sudden arterial occlusion. In rare instances the diagnosis may not be clear until several hours have elapsed.

Treatment

There can be no reasonable doubt that a great many patients who have sudden arterial occlusion are poorly treated. One frequently sees the extremity elevated and surrounded by hot water bottles. Both procedures are ill advised. Elevation diminishes somewhat the flow of blood to the extremity and the direct application of heat may cause burns which contribute to the difficulty. Tissue deprived of its normal supply of blood is extremely sensitive to thermal and chemical agents which are well tolerated by normal extremities. No treatment at all is better than elevating the extremity and surrounding it with hot water bottles.

There are three important "don'ts" in the treatment of sudden arterial occlusion: Don't delay treatment for more than two or three hours, don't elevate the extremity and don't subject it to heat which exceeds by more than a few degrees the temperature of the body. Delayed treatment means a poor prospect of recovery in those instances in which recovery would not occur spontaneously. Until the custom of applying heat disappears entirely, it cannot be emphasized too frequently

that tissue deprived of its normal blood supply does not tolerate heat well. Hot water bottles are frequently of a temperature which exceeds 150° F. and will almost invariably provoke burns if allowed to come in contact with the skin. It appears that recovery not uncommonly would have occurred if burns had not resulted from hot water bottles.

Opiates should be given immediately to control pain. As in myocardial infarction large amounts of morphine may be needed. The ingestion of alcoholic drinks is ordinarily of benefit in this regard, apparently because alcohol is an antispasmodic as well as an anodyne. The extremity should be wrapped in cotton, which can be held in place with a roller bandage, to preserve the natural warmth of the extremity. A cradle which is open at one end and contains not more than one or two electric bulbs may be placed over the extremity. The temperature of the air about the limb should not exceed 105° F. The extremity should be placed in a dependent position. When the legs are involved the head of the bed should be elevated; when the arms are involved, the patient should be in the semi-sitting position. Vasodilators should be given to relieve arterial spasm, if present. Papaverine hydrochloride, which is a vasodilator when given intravenously in doses of $\frac{1}{2}$ grain (0.032 gm.), will produce improvement in the circulation of the limb within a few minutes if it is effective at all. Care should be taken that the solution of papaverine is physiologically active. If the first injection does not cause improvement, it is questionable that further trial with this drug will benefit the circulation. If improvement follows the use of papaverine, the injection can be repeated whenever there is evidence of failing circulation to the extremity. Intermittent negative and positive pressure (pavex) has been used successfully by some physicians and should be used if a machine is available. On the assumption that one of the chief requisites for a favorable outcome is the induction of collateral arteries to assume an increased function of transportation of blood, spinal anesthesia may be tried when the lower extremities are involved, as this procedure produces maximal vasodilatation. Brachial plexus block may produce similar effects in the upper extremities. General anesthesia may be used, if the condition of the patient permits, for the same reason that spinal anesthesia may be of value. Sympathectomy likewise produces maximal vasodilatation and is of value in sudden arterial occlusion, as shown experimentally, but ordinarily, the condition of the patient does not warrant such a major operation. If the procedures outlined, exclusive of sympathectomy, do not produce a rapid improvement in the circulation, surgical removal of the clot should be considered when occlusion is the result of an embolus. As in the treatment of diabetic coma, constant attendance of a physician is required until the situation is relieved or the unfortunate outcome is definitely established. This important duty cannot be delegated to nurses or relatives. If the diagnosis is made promptly and the treatment which has been outlined is carried out promptly and with constant attention, the results will be much

better than they are when less rational or haphazard regimens are carried out. Embolectomy should be considered when impairment of circulation does not respond promptly and satisfactorily to medical measures.

THROMBO-ANGIITIS OBLITERANS

Thrombo-angiitis is a disease characterized by sub-acute or chronic relapsing inflammation of the arteries and veins of the extremities which leads to thrombosis of these vessels and produces symptoms of inflammation or occlusion of the veins and arteries of the extremities.

Nationality and Sex

Women are rarely affected. Only about twenty-one cases in which thrombo-angiitis obliterans affected women have been reported, while many thousands of cases in which thrombo-angiitis obliterans affected men have been observed. Apparently, all nationalities and races are affected but for some unexplained reason a disproportionately high percentage of patients who have this disease are Jews.

Etiology

The etiology is unknown. There is some evidence that the disease results from bacteria or their toxins, or from viruses. One case has been reported in which the patient, who was a surgeon, apparently acquired the disease as a result of having a spicule of bone pierce his finger while he was amputating the toe of a patient who had thrombo-angiitis obliterans. Smoking tobacco increases the severity of the disease but whether or not it is responsible in any direct way for the organic changes in the blood vessels has not been determined.

Complications

In addition to thrombo-angiitis obliterans of the extremities there may be involvement of the cerebral, coronary, renal, mesenteric and other intra-abdominal arteries. For some unexplained reason when there are clinical manifestations of involvement of the cerebral arteries, as hemiplegia and hemianopia, or evidence of involvement of the coronary arteries, as angina pectoris or myocardial infarction, the organic changes found in these arteries are only occasionally inflammatory in origin and more commonly are arteriosclerotic in nature. The complications mentioned are serious ones and may greatly impair the health or terminate the lives of patients who have thrombo-angiitis obliterans which ordinarily, at most, necessitates only amputation of limbs.

Clinical Types

Slow progression. This is the most common type. Coldness of the feet, which is usually the first symptom, is followed by excessive fatigue and claudication involving single digits, the arch of the foot, wrist, ankle, calf and forearm and by abnormal pallor when the extremities are elevated and by abnormal redness of the extremities when they are dependent. Gangrenous or trophic ulcers may occur.

Absence of progression. In this type mild symptoms of vascular insufficiency (excessive fatigue or the pain of claudication) progress slowly for a time and then re-

main stationary. Trophic changes are limited to proliferation of the nails and increased thickening of the skin over the weight-bearing area.

Circulatory compensation. This type may belong originally in either of the two types already described. The pain of trophic changes is mild or relieved by medical measures, or the digits may be successfully amputated. Shallow ulcers do not progress and after six months to a year healing occurs. Gradually, other symptoms largely disappear and leave the patient with extremities which are approximately 80 per cent adequate for all needs.

Acute fulminating type. Claudication appears relatively suddenly and progresses rapidly. The pain which occurs during rest is severe before gangrenous changes occur and greatly accentuated afterward. Edema and lymphangitis are present around the gangrenous region and there may be slight fever and leukocytosis. The gangrene progresses rapidly; the pain is unbearable and intractable to all measures. Amputation is necessary.

Extensive gangrene without rest pain. This type is very rarely seen. In these cases the diagnosis must await pathological studies.

Venous involvement only. This type is not unusual. The first sign of vascular disease is recurrent superficial phlebitis which may be present for many years before symptoms and signs of arterial obliterative disease appear. Edema and tenderness over the deep veins indicate deep phlebitis.

Normal pulsations in arteries which usually are palpable. The clinical syndrome is usually that of acute arterial occlusion in one or more toes followed by color changes suggestive of Raynaud's disease. Gangrene usually follows the occlusion. Amputation of the toes is followed by healing due to the normal blood supply proximal to the affected regions. Subsequently, other digits may be affected and the obliterative process may progress to a higher level. Diagnosis is dependent on the age, sex and nationality of the patient, the occurrence of superficial phlebitis, the type of pain, the signs of arterial obliteration in single digits, and the finding of organic changes, which are considered characteristic of thrombo-angiitis obliterans, in the digital arteries.

Vasomotor disturbances simulating Raynaud's disease. Clinical evidence in this type is confusing only if one fails to recognize the frequent association (30 per cent) of vasomotor disturbances in organic arterial disease. In such cases the vasomotor disturbances of the Raynaud type dominate the clinical picture and the organic nature of the disease may be overlooked. The obliterative process is evidenced by signs and symptoms of impaired arterial blood supply. Superficial phlebitis is common.

Association of arteriosclerosis. In this type the signs and symptoms of thrombo-angiitis obliterans are manifested but there is roentgenographic evidence of calcification of the arteries of the extremities. The radial arteries are usually sclerosed and the age of the patient is at the upper limits or above that encountered in thrombo-angiitis obliterans. Diagnosis is based on a

consideration of the age and race of the patient, the occurrence of superficial phlebitis, the excessive rubor of the toes, the inflammatory area around the gangrenous ulcer and excessive pain. In many cases microscopic examination of the arteries is necessary before diagnosis can be established.

Severe rest pain without trophic changes. This type is rare. The chief symptom is pain when the patient is at rest, which equals that in cases of marked gangrene. The pain is severe, aching or burning, and intractable to the usual measures. Examination of the extremities shows nothing except postural color changes, arterial obliteration, and diminished warmth. The pain is considered to be the result of ischemic neuritis.

Sudden arterial occlusion. Sudden arterial occlusion in thrombo-angiitis obliterans may occur in the course of established thrombo-angiitis obliterans or as the primary manifestation of the disease. The symptoms are similar to those noted in the paragraphs on sudden arterial occlusion, namely, sudden or gradual onset, of pain, pallor and coldness or numbness in the extremities.

Diagnosis

Thrombo-angiitis obliterans should be suspected whenever unexplained gangrene affects the extremities, whenever intermittent claudication occurs, whenever there is recurrent superficial phlebitis and whenever the extremities are cold, discolored or affected by episodes of discoloration. The diagnosis of chronic occlusive arterial disease is based on the finding of diminution or absence of pulsations in the dorsalis pedis, posterior tibial, popliteal, femoral, radial or ulnar arteries. Confirmatory signs are abnormal coldness of the extremities, excessive pallor when the extremities have been elevated for a few minutes, slow return of color when the extremities are put in the dependent position after elevation, and abnormal redness or cyanosis when they have been in the dependent position for a few minutes. The differential diagnosis of thrombo-angiitis obliterans and other vascular diseases is presented in Table 2.

Treatment

The use of tobacco in any form should be denied every patient who has thrombo-angiitis obliterans. It is apparent that it is largely useless to treat patients who continue to use tobacco.

Protection of the feet. It is extremely important that the extremity be cared for properly if gangrene is to be prevented. In more than 50 per cent of instances of gangrene this complication is precipitated by some avoidable injury. The patient should do all he can to avoid crushing or bruising of the feet or toes and to avoid scratches, cuts, fissures in the skin, burns, blisters and frost bites. Only comfortable shoes which do not bind or rub should be worn and new shoes should be broken in gradually by wearing them about an hour daily. Felt shoes or sheep skin shoes should be worn in cold weather, if the patient is subjected to cold. Diminished activity on the feet is advisable. Patients can carry on ordinary activities if these are not too strenuous. However, they

should attempt to rest the feet as much as possible. In some instances it may be advisable to begin treatment with cessation of all but necessary activities for a month or more. Toenails should be cut straight across after soaking in warm water; corns, calluses and bunions should not be trimmed or incised. Removal of ingrown toenails and minor operations on the toes have caused many instances of gangrene and these minor surgical procedures should be avoided unless performed by a physician who is familiar with the disease. The feet should be washed carefully and gently every day with mild soap and warm water; they should be carefully dried and then 50 per cent alcohol should be applied. If the extremities are excessively dry and the skin tends to crack or scale, they should be rubbed gently with hydrous lanolin or cocoa butter once or twice a day. Preparations containing iodine, merthiolate, sulpho-naphthol, carbolic acid, cresol and lysol should be avoided as they may cause ulceration or gangrene. Trichophytosis should be actively treated but not in the usual manner, as preparations containing salicylic acid may cause ulceration. A safe method of treatment is to soak the feet for half an hour twice daily in a 1:8000 solution of potassium permanganate.

Measures to increase the circulation. Local application of heat is advisable and may be in the form of radiant heat from carbon filament bulbs placed in a cradle or baker. The temperature about the feet should not exceed 105° C. Exposure to this warmth for an hour two or three times a day is advisable. Warm sitz baths, using water as warm as can be tolerated comfortably, may be used for periods of ten to twenty minutes one to three times each day. Electric pads or hot water bottles should never be applied directly to the skin. Postural exercises may be helpful. The patient should elevate the extremities for one minute, then place them in the dependent position until the rubor becomes maximal, then lie with them in a horizontal position for one minute. These procedures should be repeated five times, two or three times a day. Contrast baths may be advisable. There should be two containers, each large enough to immerse both feet to the mid-leg. In one container is placed cold water from 40 to 50° F. and in the other, warm water from 102 to 105° F. The feet are alternately immersed in the water in each container for one minute during a period of about fifteen minutes. This procedure can be repeated two or three times a day. In some instances intermittent suction and pressure (pavex) treatment should be carried out for two or three hours daily. The pressures should be varied depending on the comfort of the treatment and the effects on circulation, but, ordinarily, a positive pressure of 40 mm. of mercury and a negative pressure of 80 to 100 mm. of mercury are advisable. Ordinarily, a complete cycle should occupy about fifteen seconds. Some physicians believe that this method of treatment is valueless but it is worth a trial in most cases. Intermittent venous obstruction is considered advisable by some physicians. While machines are available which perform this treatment automatically, it can be carried out by placing the cuff of a sphyg-

momanometer about the thigh or arm. The cuff is inflated to a pressure of about 80 mm. of mercury for two minutes and then deflated for two minutes. This treatment should be carried out for a minimum of four or five hours daily. Some authors feel that a diet high in calcium or the addition of half a teaspoonful of calcium lactate or a heaping teaspoonful of calcium gluconate is advisable an hour before meals. Injections of 250 cc. of 2 per cent solution of sodium citrate as often as daily or as infrequently as two or three times a week for a considerable period of time may help. The solution is injected at the rate of 7 to 8 cc. a minute. Injections of hypertonic solutions of sodium chloride may aid. In cases of thrombo-angiitis obliterans without gangrene these injections are given in amounts of 250 to 350 cc. of a 3 per cent to 5 per cent solution twice or three times a week for about three months. Then the frequency of injection is gradually diminished for about six months. In cases of gangrene, injections are given three times each week until healing occurs or until hopelessness of further treatment has been established. The solution should be injected through a 19 gauge needle at the rate of about 30 cc. per minute. One of the best methods of increasing the circulation in thrombo-angiitis obliterans is the repeated induction of fever by means of the intravenous injection of typhoid vaccine. Lederle's triple typhoid vaccine is as good as any. For convenience of administration, a stock solution should be diluted with physiologic saline solution so that 1 cc. contains 100,000,000 killed bacteria. The desired reaction is elevation of the oral temperature to 101 to 102° F. Chill, headache and malaise may result. Excessive elevation of the oral temperature, severe chills and marked malaise are not necessary and are to be avoided if possible. The original injection contains 15,000,000 to 25,000,000 bacteria for a man and 10,000,000 to 15,000,000 for a woman. Ordinarily, each subsequent dose is increased by from 15,000,000 to 25,000,000 bacteria but the amount injected depends on the reactions. If the reaction to any injection is too severe, the subsequent injection should be increased only slightly in amount or not increased at all. If the reaction is too mild, the next injection should contain 25,000,000 to 50,000,000 bacteria more than did the preceding one. Injections may be given once or twice a week for six or eight weeks, after which a rest period of several weeks is advisable before another course is begun. Contraindications to the intravenous injection of typhoid vaccine are advanced debilitating diseases, diseases of the coronary and cerebral arteries, chronic nephritis, myocardial insufficiency, active pleurisy or pericarditis, latent or quiescent appendicitis, and cholecystitis. Vasodilating drugs are ordinarily of little use in the treatment of thrombo-angiitis obliterans since the vasodilating effects are ordinarily slight and transient. Naturally, all the procedures mentioned cannot be used at once. A good plan of treatment in cases in which gangrene is absent is cessation of smoking, protection of the extremities, the use of postural exercises, contrast baths and radiant heat. In many cases this program is adequate.

In other cases a course of injection of typhoid vaccine for several weeks may be advisable. Then a course of injection of solutions of sodium citrate or sodium chloride can be given if improvement in circulation has not been satisfactory. Treatment by intermittent suction and pressure or intermittent venous occlusion then may be added to the program if improvement in circulation is still not satisfactory.

Intermittent claudication. This can be treated by the use of tissue extracts. Most of these do not cause any significant improvement in circulation but only allow the patient to exercise longer before the distress of claudication occurs. Pancreatic tissue extract supplied by Sharp and Dohme under the label "tissue extract number 568" can be injected into the deltoid muscle in doses of 3 cc. about twice a week. Ordinarily, the amount of exercise which the patient can carry out before the distress of claudication occurs is increased; the effects of each injection last from two to seven days. Extract of skeletal muscle, manufactured under the name of "myoston" by Henning of Berlin, can be given intramuscularly in doses of 2 cc. about twice a week. It can also be given by mouth in doses of 5 to 16 cc. twice a week. Twenty milligrams of muscle adenosine phosphoric acid obtained from the same source as myoston can be administered intramuscularly in a 1 per cent solution about twice a week. In most instances if the tissue extract No. 568 does not cause an increase in the distance which a patient can walk before the distress of claudication occurs, it is useless to use the other extracts mentioned.

Treatment of severe pain which occurs while the patient is at rest. Severe pain may affect the extremities when the patient is at rest, when trophic changes are present or when the skin is unbroken. In many instances morphine or dilaudid must be used but habituation should be avoided. Codeine sulphate is efficacious in many instances. The artificial induction of fever by means of the intravenous injection of typhoid vaccine may produce startling relief. Other measures such as intermittent suction and pressure, intermittent venous obstruction and intravenous injection of solutions of sodium citrate and sodium chloride should be tried. When pain does not respond favorably to these measures and the patient loses morale and weight and is unable to sleep, section, or crushing or injection of alcohol into the posterior tibial, peroneal and sural nerves may produce anesthetization of the skin and relieve pain. In other instances, it is advisable to inject alcohol into the spinal canal for the purpose of affecting the posterior nerve roots. Neither of these procedures should be carried out by anyone other than experienced surgeons.

Treatment of gangrene. The wound should be kept clean and the extremity should be soaked for two to four hours daily in a warm saturated solution of boric acid or a 1:8000 solution of potassium permanganate or a 0.5 per cent solution of chloramine. In some instances débridement may be advisable but this should be performed only by an experienced surgeon. It is only rarely that a toe can be successfully amputated for the incision

ordinarily does not heal. Contrary to this, if fingers are amputated the wounds almost invariably heal. In all cases of trophic changes involving the digits, patience must be exercised for it is often necessary to treat patients actively for weeks or months before the gangrenous part sloughs and granulation and epithelialization occur. Other measures, such as those mentioned in the preceding paragraphs, should be used. When the ulceration is free from infection and the base is covered with granulation tissue, some of the epithelial stimulants hurry healing.* When evidence of infection is present sulfanilamide may help. When massive gangrene affects an entire foot, amputation is ordinarily the best solution. In about 80 per cent of the cases healing follows amputation of the extremity below the knee but it is occasionally necessary to perform reamputation above the knee. Necessity for amputation of the forearm has never been observed.

Sudden arterial occlusion. When this occurs, the treatment should be carried out along the lines discussed in the section dealing with sudden arterial occlusion.

Treatment of recurrent superficial phlebitis. There is no known method of successfully preventing recurrence of superficial phlebitis in all instances. In some cases removal of foci of infection may be of value. Acute episodes are best treated by rest in bed, applications of moist warm packs of a saturated solution of magnesium sulphate or boric acid. In some instances roentgen therapy of the inflamed veins may hurry resolution. Sulfanilamide may help.

Value of sympathectomy. Removal of the sympathetic nerve supply to the extremity is performed for the single purpose of increasing the blood flow. This procedure does not ordinarily affect intermittent claudication, or prevent recurrence of the superficial phlebitis or progression of the disease. It does, however, increase the blood supply to nearly maximum and minimizes the danger of gangrene necessitating amputation. It should be carried out only when trophic lesions are minimal and healing, or when they are entirely absent and when pain which occurs during rest has been almost entirely relieved or is entirely absent. Whether or not the blood supply can be significantly increased by sympathectomy can be determined by thermometric study of the extremity following the artificial induction of fever by the intravenous injection of typhoid vaccine. Thermocouples are applied to two or three digits of each extremity, one of which is the most extensively involved. Fever is induced by the intravenous injection of a suitable amount of typhoid vaccine. If the increase in the temperature of the skin of the digits is markedly in excess of the increase in the oral temperature, sympathectomy will significantly increase the circulation. Ordinarily, the increase in the temperature of the skin of the most involved digits less the increase in the oral temperature should be about twice as great as the increase in the oral temperature resulting from injection of typhoid vaccine before sympathectomy is carried out.

* Thioglycerol, manufactured by Abbott Laboratories, North Chicago, seems as good as any.

ARTERIOSCLEROSIS OBLITERANS

Arteriosclerosis obliterans is a disease characterized by thrombosis of the arteries of the extremities as a result of arteriosclerosis. It is the thrombosis and not the arteriosclerosis that causes diminution of the circulation.

Etiology

The same factors which are responsible for arteriosclerosis elsewhere are responsible for arteriosclerosis of the extremities. There is no satisfactory explanation why different patients have advanced arteriosclerosis in different locations. A common contributory factor to the development of arteriosclerosis obliterans is diabetes mellitus.

Clinical Manifestations

These are roughly the same as for thrombo-angiitis obliterans except that recurrent superficial phlebitis does not occur.

Diagnosis

Diagnosis is ordinarily along the same lines as described in the section dealing with thrombo-angiitis obliterans. Differential diagnosis is outlined in Table 2.*

Treatment

In all cases in which diabetes is present it is important that this condition be satisfactorily controlled. Treatment otherwise is about the same as for thrombo-angiitis obliterans except that one ordinarily does not give ty-

* Barker has shown recently that the fats in the blood may be increased in amounts in thrombo-arteriosclerosis obliterans. Since this does not occur in thrombo-angiitis obliterans, the value for fats in the blood may be a differentiating point.

phoid vaccine intravenously to individuals of advanced age and sympathectomy ordinarily is not advisable. Amputation, when necessary, ordinarily should be performed above the knee although it is occasionally possible to carry out amputation successfully below the knee. A substitute for inducing fever artificially by means of

TABLE I.
Clinical Classification of Arterial Diseases

- I. Non-organic
 - A. Local Distribution
 - 1. Vasoconstricting
 - a. Primary: Raynaud's disease, acrocyanosis and cold extremities.
 - b. Secondary to trauma (localized spasm), cervical rib, scleroderma, arterial embolism, thrombophlebitis, organic diseases of the arteries or nervous system or rapid vibration.
 - 2. Vasodilating: Erythromelalgia
 - B. General Distribution
 - 1. Vasoconstricting: Essential hypertension
 - 2. Vasodilating: Essential hypertension, orthostatic hypotension
- II. Organic
 - A. Local Distribution
 - 1. Thrombo-arteriosclerosis obliterans
 - 2. Thrombo-angiitis obliterans
 - 3. Embolism
 - 4. Thrombosis: Simple types, due to cervical rib, etc.
 - 5. Aneurysm
 - 6. Coarctation of aorta
 - 7. Arteriovenous fistula (congenital, acquired)
 - 8. Periarthritis nodosa
 - 9. Temporal arteritis
 - 10. Arteritis due to syphilis, rheumatism, etc.
 - 11. Ligation and severance
 - B. General Distribution
 - 1. Arteriosclerosis
 - a. Primary
 - b. Secondary to hypertension or diabetes, etc.

TABLE II.
Differential Diagnosis of Vascular Disease Affecting the Extremities*

	Thrombo-angiitis Obliterans	Arteriosclerosis Obliterans	Raynaud's Disease and Similar Conditions	Primary Erythromelalgia
Age	Between 25 and 45 years	Between 55 and 85 years	Between 17 and 35 years	Between 30 and 50 years
Sex	Males, 99%	Males, 90%	Females, 90%	Females, 70%
Race	Jewish, 42%	Any	Any	Any
Pulsation of arteries	Pulseless, 50% Diminished, 45% Normal, 5%	Pulseless, 50% Diminished, 45% Normal, 5%	Normal	Normal
Claudication	Usually present	Usually present	Absent	Absent
Excessive rubor with dependency	Present	Present	Absent	Absent
Excessive pallor with elevation	Present	Present	Absent	Absent
Gangrene	Common	Common	Rare, of minor degree	Never
Rest pain	Usually very severe	Usually mild	Usually absent	Mild to severe
Type of rest pain	Sharp, stinging	Aching	Absent	Burning
Appearance of gangrenous ulcers	Moist, inflamed; discharging	Usually dry	Small punched-out areas **	None
Superficial phlebitis	30% of cases	Absent	Absent	Absent
Roentgenogram of arteries	Usually negative for sclerosis	Usually positive for sclerosis	Negative	Negative
Color changes following exposure to cold	30%	15% to 20%	Always	Never
Temperature of extremities	Low	Low	Low	High during attacks
Edema	Frequent	Infrequent	Absent	Absent
Fats in the blood	Normal	Frequently increased		

* Percentages are approximate
** In early stages

intravenous injection of typhoid vaccine is intramuscular injection of sulfur in olive oil.* Unfortunately, this procedure is very painful and many patients object to the distress so much that the method cannot be used. A 2 per cent suspension of sulfur in olive oil is injected deeply into the lateral aspect of the midportion of the thigh in amounts of 2 to 8 cc. Warming and shaking

* Abbott Laboratories, North Chicago.

of the suspension distributes the sulfur more evenly. Injections can be given every three or four days, and alternate thighs should be used. A sufficient amount of the suspension should be injected to cause elevation of the oral temperature to about 102° F. If the fats in the blood are excessive, cream, butter, salad dressing and fat meats should be excluded from the diet. If the diet is restricted in this way, haliver oil should be used.

Gastroscope in the Diagnosis of Gastric Disease

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THE DEVELOPMENT of the flexible gastroscope by Wolf and Schindler has presented a method by means of which the interior of the stomach can be brought under direct visual observation by the endoscopic route. The question of the value of this instrument in the recognition of gastric disease naturally arises. In order to evaluate its efficiency, it is important to know how thoroughly the interior of the stomach can be visualized and whether such an examination is accompanied by an element of risk.

In my experience a satisfactory view of the interior of the stomach can be obtained in more than 90 per cent of cases. There are two portions of the stomach, however, that usually cannot be visualized. These consist of a narrow strip of the posterior wall of the stomach, along which the gastroscope rests and which cannot be separated far enough from the lens of the gastroscope for adequate visualization, and a small portion of the lesser curvature of the antral portion of the stomach just beyond the angle (Figure 1). The use of the retrograde gastroscope usually permits a more thorough view of these portions of the stomach, but it is not as desirable an instrument to use for a routine gastroscopic examination as the instrument with the lens set for right angle vision, because of greater discomfort to the patient. It is important that the two blind spots be kept constantly in mind in reporting on the gastroscopic examination of the stomach.

In a small number of cases the gastroscopic examination cannot be adequately performed because of anatomic peculiarities, such as obesity, deformity of the spinal column, inability to flex the head, and, especially, marked nervous tension. In my experience, no untoward after-effects have occurred following gastroscopy, and the procedure causes very little discomfort. Care must of necessity be exercised not to attempt gastroscopy in a case of esophageal disease, aneurysm, severe hypertension, cardiac disease, or active pulmonary tuberculosis.

Gastric Ulcer

The experienced roentgenologist has become so proficient in the diagnosis of gastric ulcer that gastroscopy

must of necessity assume a place of secondary importance. It should, however, be employed when there is a definite history of gastric distress and the roentgenologic findings are negative or of an indefinite nature. In an occasional case gastroscopy may disclose an ulcer that has not been found by other diagnostic procedures.

When seen through the gastroscope, gastric ulcer presents a very striking and characteristic picture (Figure 2). The ulcer is characterized by a border that is sharply demarcated from the surrounding tissue, and the base of the ulcer is covered by a whitish or golden yellow debris. At times, blood may be seen oozing from the base of the ulcer. When this occurs, the base generally has a dirty brown appearance. During the acute phase of the ulcer, the gastric mucosa about the ulcer is edematous and produces a deep crater. When healing occurs the edema subsides and the crater becomes less noticeable. The healing of the ulcer is further characterized by the edge of the ulcer creeping in toward the center of the crater. This process tends to throw the gastric mucosa into folds that resemble the spokes of a wheel.

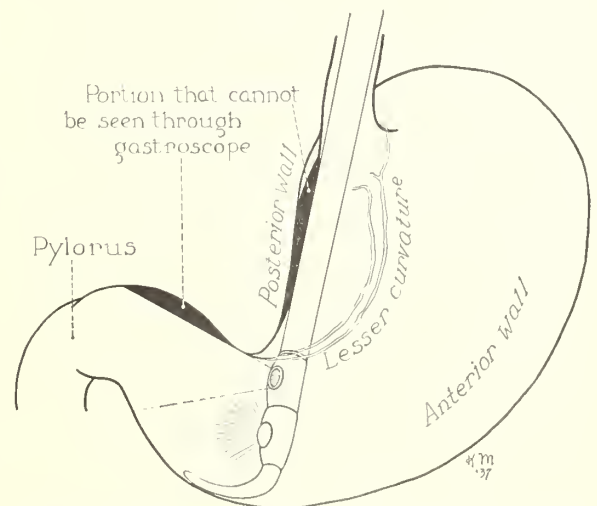


Figure 1. Portion of the stomach that usually is not visualized on gastroscopic examination.

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Figure 2. A healing gastric ulcer.

In cases in which patients are undergoing medical management for gastric ulcer, it generally can be demonstrated that the ulcer will disappear roentgenographically before it does gastroscopically. This fact may be of value in the better management of patients who are being treated medically. Probably one of the factors that sometimes mitigates against the successful medical care of patients who have gastric ulcer is that the patient and physician may be betrayed into a false sense of safety with the disappearance of the lesion on roentgenoscopic examination, and they may overstep dietary restrictions when ulcer actually is still present, as can be demonstrated gastroscopically. The use of the gastroscope as a therapeutic guide offers definite possibilities.

Gastrosocopy may be of value in the differential diagnosis of benign and malignant ulcers. The difference between the two lesions is at times very striking and the diagnosis can be established with a high degree of accuracy. Such information may be of great value in the early and proper treatment of the disease. I cannot, however, agree with those observers who feel that gastroscopy has reached the same degree of proficiency as the microscopic examination of an ulcer. This does not imply a criticism of the procedure itself, as it is well known that the surgeon may have difficulty in making an accurate diagnosis with the gross specimen in his hand. While the living tissue presents a different picture than tissue that has been severed from its blood supply, there are certain limitations that must be realized frankly. Where the least doubt exists as to the character of the lesion, the final opinion must be based on exploratory laparotomy and removal of tissue for microscopic study and examination by the pathologist.

Gastrosocopy is of very little value in the recognition of duodenal ulcer. While it is possible to visualize the pylorus it is impossible to look into the duodenum. There are certain findings that may, when present, be regarded

as of doubtful presumptive evidence of duodenal ulcer. When pyloric obstruction occurs in association with duodenal ulcer, diffuse gastritis is an invariable accompaniment. This, in association with a loss in tone of the gastric wall, should suggest the possibility of an underlying duodenal ulcer. A less frequent finding in my experience has been the presence of an acute ulcerative type of gastritis, which involves only the antrum and which may be found associated with a very acute and active type of duodenal ulcer.

Gastric Carcinoma

Any procedure that can aid in the early recognition of gastric carcinoma is worthy of the most careful consideration. Gastrosocopy may be of definite value in this respect, as I have learned from experience. All too frequently the diagnosis is made only after the disease has reached a stage of inoperability. While the diagnosis of gastric carcinoma can be made with a high degree of accuracy by roentgenologic examination, small lesions, especially in the cardiac end of the stomach, may offer considerable difficulty. In my experience this is more likely to occur with carcinoma than with gastric ulcer. There is no doubt that combining gastroscopy with roentgenologic studies may be of aid in the more prompt recognition of carcinoma of the stomach in certain cases.

When visualized through the gastroscope, carcinoma of the stomach presents all of the variations seen in carcinoma elsewhere in the body. It is usually characterized by a nodular infiltration of the gastric wall and by decreased motility and elasticity. The area of infiltration tends to blend in well with the surrounding gastric mucosa. Tumefaction frequently occurs (Figure 3). The area of malignant infiltration tends to lose the orange-red color, which is so characteristic of normal gastric mucosa, and it becomes grayish-white in appearance. When ulceration occurs the edges of the ulcer are ragged and not sharply demarcated from the surrounding tissue. The base of the ulcer is covered by a dirty, necrotic debris which frequently is bloody. The diffuse carcinomatous infiltration, such as seen in linitis plastica, may offer great difficulty in diagnosis. This is because the stomach wall may remain pliable; the infiltration is diffuse and very little or no normal gastric mucosa remains for a comparative study of change in color. To add to the difficulty, ulceration is generally absent.

Great care must be exercised in the identity of early changes in the gastric mucosa which may be the forerunner of a gastric carcinoma. Recently, I had the opportunity to examine a patient who complained of gastric distress. Repeated roentgenoscopic examinations of the stomach had failed to reveal anything of a pathologic nature. On gastroscopic examination a localized change was noted high on the lesser curvature, which I misinterpreted as an atrophic gastritis. On re-examination of the patient four months later, it was found that the affected area was involved by an extensive carcinoma. It is in cases of this type that, with greater experience, such errors may be avoided and the patient brought to



Figure 3. Nodular type of carcinoma.



Figure 4. Small superficial gastrojejunal ulcer.

operation when it can be carried out with some chance of success.

Emphasis has been placed on the value of gastroscopy in the determination of the operability in carcinoma of the stomach. When lesions involve the cardia, or in cases in which metastatic nodules are scattered through the gastric mucosa, operation seems inadvisable. In many cases it is impossible to determine the extent of the gastric involvement because the tumor mass interferes with the thorough visualization of the interior of the stomach. In cases of this type, or in cases in which the least doubt exists as to the extent of the lesion, exploratory laparotomy seems advisable when the general condition of the patient is such as to warrant the procedure.

Benign Tumors

The diagnosis of benign tumor of the stomach may at times offer considerable difficulty, not only in its recognition but also in its differential diagnosis. Gastroscopy may be of value in this respect. Benign tumors of the stomach are usually characterized by the fact that the mucosa overlying the tumor is not infiltrated, is usually movable, and does not lose its normal color. It is surprising what small gastric polyps can be recognized gastroscopically. The differentiation of the various types of benign tumor is at best difficult or impossible. It also is probably unwise to state with certainty the absence of malignant change in a benign tumor, because experience has taught that malignant changes may be found in gastric polyps that gastroscopically appear to be benign.

The Stomach After Operation

The development of gastric distress after operation on the stomach is always a source of great worry and concern to the attending physician because of the difficulty in interpretation of the clinical and roentgenographic

findings. Gastroscopy, in my opinion, can be of considerable value in cases of this type. For a proper evaluation of the gastroscopic picture it is important to have a definite knowledge of the various types of gastric operations and their effect on gastric function. One rapidly learns to distinguish the well placed and properly functioning gastro-enterostomy or a Polya type of anastomosis. In many cases it is possible to examine a considerable portion of the stoma and in a few cases I have been able to introduce the gastroscope directly through the anastomosis and obtain an excellent view of the entire stoma.

Gastritis is a frequent finding after operation. Gutzeit said that this finding is almost always present after gastric operations. In my experience it is especially likely to occur in those cases in which postoperative gastric complications are present. A frequent finding in cases in which postoperative gastric distress closely simulates the clinical picture of gastrojejunal ulcer is the presence of localized inflammatory changes about the gastro-enteric stoma. This may be associated with small areas of superficial ulceration. In such cases the patients frequently respond very nicely to adequate medical management and the symptoms subside. When such small areas of superficial ulceration occur on the jejunal side of the stoma, gastrojejunal ulcer must be very seriously considered because the jejunum has a notoriously low resistance to ulceration. True gastrojejunal ulcers may offer considerable difficulty in diagnosis, as they tend to occur in the distal loop of the bowel, which is the most difficult portion to examine gastroscopically (Figure 4). It is possible that, if patients who were to be subjected to a gastric operation were subjected to gastroscopy before operation, and if those who presented evidence of gastritis were placed on preoperative medical management, postoperative complications would be less frequent than they are at present.

Gastroscopy has probably done more than any other procedure to awaken interest in the problem of gastritis. Farber, Konjetzny, Henning, Gutzeit and others have accumulated sufficient clinical and pathologic material to demonstrate definitely that gastritis is a very real pathologic condition. The greatest obstacle, however, in this interesting problem is to determine where the border line exists between normal physiologic changes in the gastric mucosa and those of a pathologic nature. The tendency for the beginner in gastroscopy is to call any and every condition that is associated with the least hyperemia or increased secretion of mucus in the stomach "gastritis." In my estimation, if such a diagnosis is restricted to those conditions associated with definite changes in the mucosa, the gastroscopic and clinical pictures will more closely approximate each other. At the present time gastritis cannot be regarded as a distinct clinical entity; its relationship to other forms of gastric disease is not known.

Gastritis has been divided into a great many types. Probably the simplest classification is to divide it into the acute and chronic forms. Under acute gastritis can be grouped those conditions in which the changes in the gastric mucosa are rather well limited to the superficial layers of the mucous membrane. This form of gastritis usually is classified as the catarrhal type. It is most likely to occur in association with acute infectious disease or acute dietary or alcoholic indiscretions. Gastroscopically, it is characterized by edema and hyperemia of the gastric mucosa and an increased accumulation of viscid mucous secretion between the gastric rugae. Small superficial areas of ulceration may or may not be present. The entire process may appear and disappear with surprising rapidity, and it is usually self-limited although it may progress to the chronic form of gastritis.

Chronic gastritis may assume many different forms, all of which blend one with the other; all different stages may be noted in the same case. Chronic gastritis is best subdivided into two main subdivisions, the chronic hypertrophic and the atrophic forms. Chronic hypertrophic gastritis is distinguished by a loss in the luster of the gastric mucosa. Because of infiltration, the gastric rugae become hypertrophied and the mucous membrane assumes a granular or cobblestone appearance. The walls of the stomach become less pliable. Submucosal hemorrhages may appear, and areas of ulceration are not uncommon. Such ulcers usually are small in size, multiple, and somewhat deeper than those of superficial

acute gastritis. The area of ulceration is frequently surrounded by a zone of hyperemia. The base of the ulcer is generally covered by a yellow exudate. The recentologist is developing an increased aptitude in distinguishing this type of gastritis.

Some observers feel that the chronic hypertrophic gastritis is often the forerunner of gastric ulcer. Positive proof, however, is lacking in this respect. Berg and Konjetzny were of the opinion that the symptoms of gastric ulcer are often caused by the gastritis that is associated with the ulcer, and that as the gastritis improves, so do the symptoms of ulcer, and vice versa. Clinical and surgical experience has demonstrated that chronic hypertrophic gastritis may be a frequent cause of hematemesis, and that in any case of unexplained hematemesis gastroscopy is indicated.

Atrophic gastritis is characterized by an atrophy of the gastric mucosa. The atrophy may be either localized or diffuse. The mucosa loses its normal orange-red color, which is replaced by a grayish-green or yellow hue. The blood vessels in the submucosa, which normally are not discernible on gastroscopic examination, can now be seen passing under the atrophic mucous membrane. This form of gastritis is frequently associated with pernicious anemia. It is thought by some observers to be the forerunner of gastric carcinoma. While positive proof is lacking, experiences such as that previously described under the heading "gastric carcinoma," make for extra caution in treating patients who have this form of gastritis.

Summary

An attempt has been made to evaluate the advantages and limitations of gastroscopic examination of the stomach. The procedure can in no respect be regarded as a complete gastric examination. It should be looked upon as an adjunct to the procedures which have been found valuable in the past. It is, furthermore, an examination that cannot be regarded as a routine office procedure, for it requires a wide experience and considerable skill to be of maximal value. It is, however, a procedure that should be employed in any case in which the diagnosis is uncertain, or in which there are positive clinical symptoms, or in which the results of routine diagnostic procedures are of negative value. The careful use of the gastroscope should be of definite value in the study of gastric disease, and it may add greatly to the knowledge of conditions present.



Infectious Mononucleosis*

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INFECTIONOUS MONONUCLEOSIS, or more popularly, glandular fever, has been recognized for almost half a century, though not admitted by most observers as a true clinical entity until comparatively recent years. Even now, though its symptomatology is well-defined and its prognosis accepted, the etiology of the disease remains uncertain and the therapy symptomatic and non-specific.

That it belongs among the acute infectious, though probably not the most highly communicable diseases, seems definite enough, as indicated by the occurrence of mild epidemics and by a rather seasonal prevalence. Our experience includes several cases among room-mates, two instances of closely successive infections within family groups, as well as sudden small "flurries" of cases widespread upon a university campus from time to time. In pediatric practice the disease is observed to assume more highly transmissible characteristics, which may account, partially at least, for the higher relative frequency of infectious mononucleosis among children and young adolescents. As high as 90.6% of exposed children contracted the malady during an epidemic reported in New York State, compared with a coincident adult morbidity of 46.8%.

As early adult years are left behind, occurrence of infectious mononucleosis seems much more truly sporadic. Speculation on this phenomenon conjures up a variety of factors capable of playing a part. The relatively greater predisposition among children to affections involving the lymphatic system, the undoubtedly many mild cases in adults that pass unrecognized for want of microscopic blood studies, and the possible development of some degree of immunity with passing years or through slight attacks suggest themselves as explanations for future investigations to shake or to confirm.

Granted the facilities of a modern student health service, clinicians are particularly apt to uncover a significant number of cases of glandular fever. Perhaps it is fairer to say that, having been consulted early by young people encouraged to report minimal ill health to the college physicians, such doctors, backed by readily available laboratory aids, will more commonly succeed in arriving at a hematologic explanation for the often very vague symptoms reported and the frequently trifling signs observable.

The present study is concerned with data secured from the histories and clinical records of 100 consecutive cases of infectious mononucleosis treated at the Student Infirmary of the University of Wisconsin, beginning with

the school year of 1930-31 and ending with that of 1935-36. Summer sessions are included.

Table 1 gives the distribution of cases by months for the six year period. It is evident that, if due allowance be made for decreased enrollment during summer sessions and for the slack vacation periods of Christmas, inter-semesters and late summer, no month seems truly free of glandular fever, though the colder months are admittedly more likely to show its presence. The curve traced by the incidence of infectious mononucleosis, although based on a relatively small group of cases at any given time, follows almost identically that displayed by the census of acute respiratory infections recorded at the University for many years. It must be noted, however, that some school years show a relatively low or high percentage of infectious mononucleosis admitted to the Infirmary as related to the total admissions for all causes. The average over the six year period is 0.81%, while in 1933-34 glandular fever cases climbed to a point where they comprised 1.28% of all Infirmary patients, and in 1930-31 fell to 0.37%. These ratios, though not conclusive, do bear out the personal opinion of this and several other writers that certain years may show mild "epidemics" of infectious mononucleosis.

Of the 100 cases summarized, 41 were females and 59 males, ranging in age from 16 to 28, with 84 individuals between 18 and 23 years. The average age for the whole group was 20.76 years—compatible with a university community, as was the relative sex distribution.

Three main types of onset were recognized. In Group I, comprising 19 individuals, there was an acute onset with sore throat, fever, aching muscles, sometimes nausea and vomiting. These cases were so ill that they usually came directly to the Infirmary for bed care, in our series reporting invariably within 24 hours after the development of symptoms. Group II was made up of 41 cases showing a slow and insidious onset, with subjectively unaccountable malaise, fatigue, anorexia, headache and similar ill-defined symptoms, present for days or occasionally for weeks before the patient reported to a physician. In these cases, the suspicious history, usually coupled with obvious adenopathy of the cervical lymph glands, rendered the making of a white blood cell count and differential blood smear advisable. This done, the morphological blood findings were immediately suggestive of the presence of infectious mononucleosis. Group III might easily be a sub-class of Group II, but caught at an earlier stage, or blessed with slightly more severe warning symptoms. In Group III were encountered 40 students with every symptom apparently heralding a mild la grippe, an acute respiratory infection, or fatigue disproportional to recent activities. All

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showed preliminarily a normal or almost normal blood picture and few if any conclusive physical findings. Within a few days, however, the typical lymphocytic shift had shown up in serial blood smears, and the cases were diagnosable as infectious mononucleosis.

Inquiring into the *chief complaint* of each patient at the time of admission to the Infirmary, we found the following:

Chief Complaint:	No. of Cases
Sore throat	46
Headache	15
Feverishness	7
Unusual and severe fatigue	7
Running nose	7
Swollen glands in neck	7
Rash on body	5
Aching of muscles generally	2
Abdominal pain, general	2
Backache, lumbar	1
Puffiness around the eyes	1
Total	100

It is thus demonstrated that the patient is more commonly conscious of angina than of lymphadenopathy. Taking into consideration *all* the complaints appearing in the case histories, however, we have attempted to group the whole list of symptoms, both chief and secondary, as follows:

Symptoms:	No. of Cases
Sore throat	64
Headache	57
Aching back, legs, muscles, etc.	55
Fatigue, malaise, weakness, etc.	54
Sore eyeballs	39
Chills	22
Abdominal distress	22
Cough, non-productive	21
Anorexia	19
Soreness in lower left chest or upper left abdomen	19
Rash on skin	17
Sore, spongy or bleeding gums	14
Nausea	13
Dysphagia	12
Coryza	11
Constipation	10
Conjunctivitis	10
Vertigo	7
Night-sweating	6
Dysuria	5
Vomiting	3
Ear-ache	3
Syncope	2
Tachycardia	2
Intractable insomnia	1
Sudden loss of weight	1

Interesting in the light of the above subjective complaints, is the relative frequency of occurrence of the commoner physical signs observed by the examining physicians at some period during these 100 illnesses:

Objective Finding:	No. of Cases
Lymphadenopathy	100
Cervical involvement	93
Axillary involvement	58
Inguinal involvement	52
Epitrochlear involvement	17
Submaxillary involvement (lymph group)	16
Submental involvement	4
Post. Auricular involvement	4
Occipital involvement	2
Pharynx acutely inflamed	75
Spleen palpable	70
Vincent's organisms found on smears	62
Gingivitis	34
Pharyngo-tonsillitis	26
Pharynx, unspecified	2
Tonsils or tonsil tags acutely inflamed	51
Gross confluent tonsillar exudate	18
Discrete follicular tonsillar exudate	13
Diffusely reddened tonsils	10
Moderately injected tonsils	6
Ulcerated, bleeding tonsils	4
Nasal congestion and discharge	48
Palpably enlarged liver	37
Skin rash	17

Fetor oris, coated tongue, etc.	16
Soft palate and uvula edematous	13
Ulceration of gums, cheeks, tongue, pharynx or palate	11
Petechial hemorrhages in pharynx, pillars or uvula	7
Laryngeal inflammation, edema, aphonia	5
Membrane in pharynx	4
Ear drums acutely inflamed	3
Jaundice	3
Edema of face and eyelids	1

As regards the status of the fauces, 44 patients had had tonsillectomy with no demonstrable regrowth of lymphoid tissue, 15 cases exhibited tonsillar tags or follicular regrowths of varying sizes, while in 41 individuals the tonsils had not been treated surgically. The lingual tonsil was not found remarkably involved in any of the cases reported.

The rashes mentioned were in general of a fine, discrete, pinkish-red, maculo-papular or macular type, confined mostly to the trunk, neck, proximal parts of the extremities, and less frequently seen distally and on the face. Two were reddish-brown in color, and two purplish-red. Three were truly urticarial, two frankly purpuric, three mildly pruritic, and two showed some tiny vesicles scattered among the maculo-papules. No pustules were observed. The rashes described best fell within the category of so-called toxic dermatitides, if a descriptive term is to be attempted that will give a reasonably accurate picture of the exanthems seen. It should be understood, however, that no two of the rashes observed were identical.

As brought out above, generalized lymphadenopathy was universally present in the series, with the cervical lymph nodes most commonly and prominently enlarged, particularly those situated in the posterior triangles. Over half the cases showed palpably enlarged axillary or inguinal chains. Epitrochlear glands were palpable in a lesser percentage of our cases than in series reported by several previous observers. The enlarged glands were always discrete, firm but not very hard, only occasionally tender, and rarely of great size. There was no instance of their suppurating. From the rather suggestive symptomatology, tracheobronchial and mesenteric lymphadenopathy were judged to be present in a few cases, though this could not readily be proved. These last named groups included, respectively, patients with chronic, dry cough, and those with prolonged nausea and vomiting, with or without jaundice.

Splenomegaly sufficient in degree to allow the spleen to be palpated was present in at least 70 cases. The texture of the inferior splenic edge varied from soft to firm, occasionally being found to be moderately tender. In 14 such individuals, and in 5 others without palpable splenic tumor, very definite soreness in the left lower thoracic region, axillary plane, or nagging discomfort in the upper left abdominal quadrant was reported fairly early in the course of the disease. Inasmuch as it is generally conceded that the spleen is not ordinarily palpable unless approximately twice its normal size, it seems probable that many cases not proceeding as far as palpable enlargement of the organ do actually experience some degree of splenomegaly.

Fever was present in 95 of our cases, lasting from 1 up to 23 days, defervescing by lysis, and averaging 5.7 days per patient. The average stay in hospital was more than double this figure, since the resumption of normal temperature seldom meant a reasonably complete return of the blood elements to normal proportions, or left a patient who felt sufficiently strong to resume his scholastic activities. The largest group of patients, 55%, was found in the zone spending from 5 to 11 days in hospital, while the average hospitalization for the whole 100 cases was 12.9 days. The shortest stay was 2 days and the longest 39. Infirmary care in excess of 3 weeks' duration was required by 13 patients. All cases, except a few who left the University to return to their homes, were followed up through the medium of the Student Health Clinic for varying periods, in a few instances for several months. A recrudescence of the disease was noted in 2 cases 5 days after discharge from hospital, in 1 case 6 weeks later, while clear-cut second attacks occurred in 2 individuals 2 years after their first bout with the infection. One of these last two patients, now a physician, has experienced at least 4 attacks diagnosed as infectious mononucleosis, each one ushered in by what may best be described as gripe-like symptoms, and very recently a fifth, quite severe illness, reported as presenting for the first time characteristics suggestive of a possible agranulocytosis. Recovery followed.

Temperature records disclose, as in Table 2, that 5 patients remained afebrile throughout their hospitalization, 45 did not show temperatures above 101° F., 40 had a febrile rise not over the level of 102.9° F., and in the remaining 10 cases, pyrexia exceeded 103° F.

Analysis of the hematologic studies made upon the 100 cases shows (Table 2) that the total leukocyte response tended to vary directly with the febrile division of patients already mentioned. Ranging from an average maximum leukocytosis of 10,990, an average maximum mononucleated cell count of 6,590 (59.9% of the total differential), and an average hospital stay of 7 days in the afebrile cases, we note a steady progression in all the factors enumerated until the group experiencing temperatures of 103° F. or over, is reached. In this last-named, and most prostrated bracket the average maximum leukocytosis stood at the level of 20,110, the average maximum mobilization of the lymphoid elements at 14,347 (71.3% of the total differential), while the average stay in the Infirmary had risen to 21.1 days.

A survey of all the 1,159 leukocyte counts amassed in the series shows, as in Table 3, that the highest point among the maximum white blood cell counts recorded in individual cases was 36,000, while the smallest of the maximums was a count of 6,000. The largest aggregation of maximum counts occurred in the zone between 10,000 and 19,999 leukocytes, true in 59 of the patients. Minimum counts showing up during the 100 illnesses began with 2 at the 3,000 cell level, and ran only as high as 14,500. The largest grouping in the minimum series lay between 5,000 and 9,999 leukocytes, where we find 80 cases densely crowded.

Chart 1 shows the average leukocyte counts, together with their differential distribution of polymorphonucleated and mononucleated cell types, at successive stages of a few days' duration following admission to hospital. It is revealed that the highest leukocytosis was generally reached near the end of the second week. The preponderance of mononucleated cells obtained from the outset in these averages, but became greatest between the 6th and 15th days, at which period these elements represented over 62% of all leukocytes present. The ultimate swing back to polymorphonuclear dominance was rather leisurely, and was not found to have assumed normal proportions in any case here recorded until several weeks after the subsidence of the acute phase of the mononucleosis. It is true, of course, that the later periods represented in Chart 1 give the blood picture only of those cases still under observation at such late dates. However, certain of the cases recovering earlier were followed in the Student Health Clinic and revealed a lymphoid shift persisting for two months or more, though the individuals reported feeling in excellent health.

In all the cases observed the lymphocytosis was relative, and in a large number became absolute at some period of the disease. There were 24 patients who showed a fall in granulocytes to a point below 20% of the total leukocytes present, and in 5 of these individuals the level declined to below 10%. The lowest percentage reached in our series was 6%, and the lowest number of polymorphonuclears in any count was 315, in a count of 3,150. The lowest percentage in the author's experience was in a case seen in 1929, and not included here. In that patient the granulocytic elements represented only 2% of the white blood cells.

With the exception of one case complicated by gastric hemorrhage from another cause, none of our patients showed any significant degree of erythrocytic impairment or much decline in hemoglobin values. Not all cases had red blood cell counts made, though of the 54 cases so studied several had benefit of repeated examinations, there being a total of 105 such determinations. Among 28 females the lowest recorded erythrocyte count was 3,200,000 and the lowest hemoglobin (Tallqvist) 62%. The highest figures for the women were 5,200,000 and 82% respectively. A total of 26 males gave minimum readings of 4,500,000 and 70%, and maximum figures of 6,200,000 and 88% respectively. That no appreciable amount of anemia was observable is borne out further by the fact that 84.7% of all the red cell counts gave totals between 4 and 5.5 millions, while 62.8% of the hemoglobin values were found to lie between 75% and 85% by the rough Tallqvist standards. These figures, in the writer's experience, compare favorably with the predicted results from a study of average, healthy students done at the time of routine physical examinations.

Thrombocytes were not counted routinely early in the series, but this procedure was being included toward the end of the period under discussion. In 17 cases studied

TABLE 1
Incidence of Infectious Mononucleosis Among University of Wisconsin Students,
Per Month, Year, School Term and 100 Infirmary Admissions

	1930	1931	1932	1933	1934	1935	1936	Total	
January	1	3	2	2	5	1	14	January	
February	0	2	1	1	0	5	9	February	
March	0	2	1	3	2	4	12	March	
April	0	3	2	3	2	2	12	April	
May	0	3	0	2	0	1	6	May	
June	0	3	1	0	4	0	8	June	
July	0	2	0	1	0	1	4	July	
August	0	1	0	0	0	1	2	August	
September	0	0	1	0	0	0	1	September	
October	2	1	3	3	4	0	13	October	
November	4	1	2	6	1	0	14	November	
December	0	0	1	2	2	0	5	December	
Total	6	6	23	19	18	15	13	100	Total

School Term	No. Cases	Total Infirmary Admissions, All Causes	Infectious Mononucleosis Rate per 100 Infirmary Admissions, All Causes
1930-31	7	1,900	0.37%
1931-32	21	2,461	0.85%
1932-33	14	2,098	0.67%
1933-34	23	1,794	1.28%
1934-35	20	2,183	0.91%
1935-36	15	1,876	0.79%
Total	100	12,312	0.81%

they were never found very critically reduced, only one patient showing a platelet count as low as 100,000.

Diagnosis in our 100 cases was accomplished without recourse to serological determination of the presence of specific agglutinins. This may occasion surprise in quarters where the method is routinely employed, and perhaps we should have included that diagnostic procedure. Frankly, however, the clinical entity of infectious mononucleosis was encountered so frequently in our type of practice that we grew accustomed to base the diagnosis on the history of onset, the clinical picture before us, and a painstaking blood smear repeated as often as seemed necessary. At this point attention should be drawn to the valuable information obtainable from a differential count of the filament—non-filament type. During the six-year period covered by this report there occurred among the same student body from which our cases were drawn two cases of acute leukemia and two of Hodgkin's disease, each diagnosed without confusion with infectious mononucleosis. The failure of cases of glandular fever to show early any significant degree of anemia or the subsequent rapid development of anemia was considered of diagnostic and prognostic weight, as was their tendency to maintain a normal or only slightly decreased supply of blood platelets. It was a rare case

TABLE 2.
Ascending Scale of Severity of Infectious Mononucleosis as Shown by Fever, Leukocytosis, Relative Lymphocytosis and Days Spent in Hospital

Division of Cases	No. of Cases	Average Maximum Leukocytosis	Average Maximum Lymphocytosis	% Mononucleated Cells	Average No. Days in Hospital
Group A (Afebrile)	5	10,990	6,590	59.9%	7.0
Group B (Temperatures to 101° F.)	45	15,462	9,483	63.6%	10.6
Group C (Temperatures to 102.9° F.)	40	16,881	11,232	66.5%	13.1
Group D (Temperatures 103° F. or over)	10	20,110	14,347	71.3%	21.1

TABLE 3.
BLOOD COUNTS

A. Highest and Lowest Minimum Counts	Leucocyte Total	Individual Cases: Maximum Counts
	Over 35,000	1 (Highest, 36,000)
	Up to 35,000	4
	Up to 30,000	3
	Up to 25,000	17
	Up to 20,000	28
(Highest, 14,500)	5 Up to 15,000	31
(Lowest, 3,000)	80 Up to 10,000	16 (Lowest, 6,000)
	15 Up to 5,000	
	100	100

B. Erythrocyte and Thrombocyte Counts, Hemoglobin Values: (x)

No. Counts	Red Blood Cells	No. Exams	% Hbn.	No. Counts	Platelets
10	6.0 million	2	90%	2	400,000
	5.5 million		85%		350,000
34	5.0 million	37	80%	1	300,000
33	4.5 million	29	75%	3	250,000
22	4.0 million	19	70%	4	200,000
5	3.5 million	12	65%	4	150,000
1	3.0 million	6	60%	3	100,000

(x) These determinations not made on all patients.

C. Maximum and Minimum Erythrocyte Counts and Hemoglobin Readings:				
Sex	No. Cases	Category	Red Blood Cells	Hbn.
Male	26	Lowest (y)	4,500,000	70%
"		Highest	6,200,000	88%
Female	28	Lowest	3,200,000	62%
"		Highest	5,200,000	82%

(y) Excluding 1 case with gastric hemorrhage.

whose diagnosis was not reasonably certain by the end of two or three days' observation at the most. Had the ultimate findings at such time have indicated a leukemia, for instance, instead of the benign glandular fever, neither the error nor the time factor could have influenced the outcome one iota. These observations are not intended as critical of the value of heterophile antibody phenomena in infectious mononucleosis. They mean solely that in the opinion of the author the diagnosis can usually be arrived at in advance of the aid promised by the agglutination procedure. If sheep cell agglutination tests are readily available, of course, they may be employed as clinching evidence.

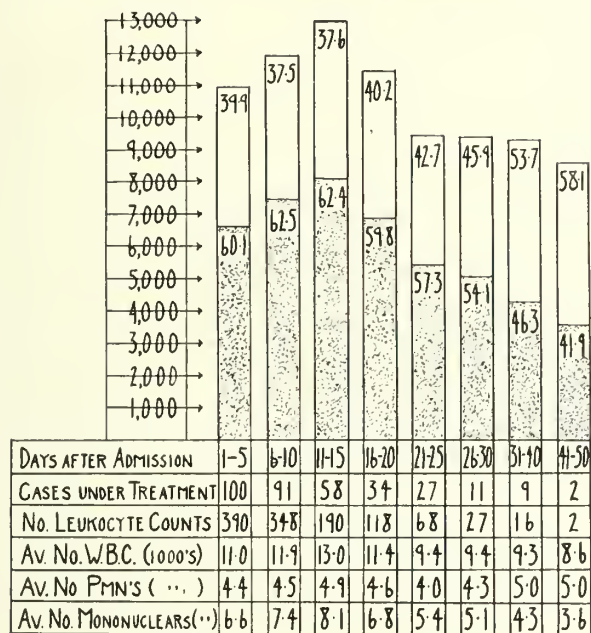
Treatment of glandular fever is so far purely symptomatic and supportive, and will not be discussed here. Stress is needed, however, upon the necessity for a careful and often protracted period of convalescence. Fatigue tends to persist. There should be extra hours of rest, a generous diet reinforced by appropriate tonic measures, avoidance of heavy or prolonged exertion, and as little association as possible with sick patients, particularly those with respiratory infections. Those recovering from infectious mononucleosis seem notably susceptible to other communicable diseases.

Summary

The study includes 100 consecutive cases of infectious mononucleosis occurring among university students over a six-year period between 1930 and 1936. Laboratory examinations are tabulated and analyzed, as are the pre-

TOTAL LEUKOCYTES:

DIFFERENTIAL DISTRIBUTION: %



□ POLYMORPHONUCLEARS
 ■ MONONUCLEARS

CHART 1.

Relative Distribution of Leukocyte Forms During Course of Disease

vailing subjective symptoms and objective clinical findings.

Conclusions

1. Infectious mononucleosis is a mildly communicable disease of unknown etiology, commonest in children and young adults. Epidemics may be encountered.

2. It occurs at any season of the year, but is more apt to be seen in northern climates during the colder months.

3. Although of a benign course as contrasted with the serious and fatal diseases it may occasionally resemble, it is often the cause of severe symptoms and of prolonged disability.

4. Diagnosis is not usually difficult and can be made, as a rule, by means of a careful history, physical examination, observation of clinical progress, and serial leukocyte and differential counts.

5. Both a relative and an absolute lymphocytosis are sooner or later observed, generally accompanied by a moderate to high leukocytosis. Anemia is not often produced.

6. The higher the leukocytosis and relative lymphocytosis, the sicker the patient and the more prolonged the illness in most cases.

7. Therapy is non-specific and symptomatic.

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The Scope of Student Health Practice

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THE FIRST student health service in America was organized at Amherst College in 1859. Doctor Edward Hitchcock, in charge of hygiene, saw many students dropping out of college, particularly in the spring, because there was no one under the college administration who had the responsibility of caring for the boys' health. College students were considered by everyone to be a healthy, vigorous group of young people, and disease was supposed to be an exceptional occurrence. When a disease appeared and advanced to the stage where the patient and his friends became alarmed, a physician was called. Doctor Hitchcock realized the enormous loss of time the student suffered as a result of the lack of an aggressive health service, and deplored the fact that so many students' careers were permanently broken because of illness. Putting his convictions to work, he inaugurated a well-rounded health program which in many fundamental respects remains an ideal to be emulated today. For the next forty years there was little progress in this field. A number of educational institutions however furnished a health service which was limited chiefly to the care of athletic injuries and minor injuries of all types.

About the beginning of the century, college administrators began to realize that one important function of the college was badly neglected. They began to see that the student's health was an important factor in his academic success and happiness, the student body was not by any means a universally healthy group, and that the type of illness from which it suffered was largely preventable. Many institutions attacked this problem through already organized departments of physical education and there developed over a period of many years the feeling that the maintenance of health and the consequent prevention of disease was a matter of proper and adequate physical exercise. Physical education and activity programs thrived, and did a great deal to improve the physical condition of students in required gymnasium courses; but this was not the complete answer to the problem. Many of these departments were headed by well-trained physicians and in these the conception of the physically strong body being the acme of disease resistance was not carried to the extreme. Gradually, we arrived at the conclusion that we must have a department in the college which should be exclusively concerned with maintaining the physical and mental health of the student, and that this department could not fulfill its whole function unless it attacked its problems of health and disease from a clear-cut, scientific medical point of view.

In 1920, a few of the leaders who were struggling with the problems of administering their respective

health services organized the American Student Health Association, and this association has been a beacon light in guiding the policies of health services throughout the country. The highest type of medical ideals and standards are evident in the annual meetings of the association, and its resolutions and recommendations encourage the highest type of preventive and clinical medical practice. The proceedings of the first and second National Conferences on College Hygiene sponsored by those interested in student health embody a complete summary of the conclusions arrived at by the best medical thought in the country regarding administration and practice in student health efforts.

The college health service stands in the same position of service to the student body as the private pediatricist does to his child patients. Their fields of activity are broad in one sense; but are confined to a rather narrow age group. This allows the pediatricist, as it does the college physician, to limit his studies to the prevention and cure of a comparatively well defined group of pathological conditions, and the college physician may concentrate his efforts upon the chief health hazards that are prominent between the ages of 17—22.

Currently, it is the practice in the typical health service to encourage the student to consult the physician at the earliest sign of any deviation from the normal and many influences are brought to bear in an effort to get the patient to the physician before the disease has completely upset the normal physiology of the body. There is no financial obligation connected with a visit to the physician's office for advice or treatment. This serves to bring the patient to the doctor before the symptoms actually demand relief and brings pathology to the physician in its preclinical manifestations. It opens up an exceptionally fine opportunity to study disease at a stage never before presented in the aggregate to medical science and offers opportunity for research in a field never before explored. Incidentally, it helps materially in the control of the common contagious diseases. The general field of internal medicine has already received significant contributions made possible solely through investigations carried on in college health services. This is particularly true in connection with research in the etiology and treatment of the upper respiratory infections, hypertension, albuminuria, tuberculosis, dysmenorrhoea, psychoneuroses, and other conditions. The college student body is a particularly alert, coöperative group with which to work. Investigations can be planned and carried out systematically on selected groups, and it is always possible to have the control aspect of the experiment well-organized, so that conclusions will have significance.

The college health service is a happy combination of preventive and curative medicine. To efficiently carry

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out any preventive medical program it is first necessary to study the field in which prevention is to be practiced. This study will disclose the factors or situations which give rise to the preventable illness, or will show what particular groups of individuals are unusually susceptible to the disease or disability. If malaria is to be prevented, one must first find out what type of anopheles carries malaria, where and how they breed and transmit the disease from one human being to another. Destruction of all mosquitoes could not be considered an intelligent anti-malaria program. If football injuries are to be minimized, one must know what types of contact give rise to injury and which individuals are most susceptible to these injuries. With these data at one's command, intelligent preventive measures can be effectively worked out. The health service offers this sort of opportunity for study. Such a large proportion of illness and disability occurring in a college group is preventable that it offers the health service director a distinct challenge to collect the data and put it to work in a well-planned preventive attack. If it is found that a particular illness has a much higher incidence in a certain type, or group, of students, preventive measures can be concentrated in this particular group with some assurance of improving results.

The American college student health service has dealt effectively with a number of pathological conditions, and the program developed in many of our colleges deserves mention. Recently tuberculosis, particularly pulmonary tuberculosis, has graduated into the class of diseases considered controllable. It merits rank in the group, however, largely because facilities are now available for an *early* diagnosis, and not because any specific prophylaxis or cure has been discovered. Our ability now to make a diagnosis of tuberculosis in its preclinical stage is perhaps the greatest weapon we have in bringing the individual case under control and in preventing contagion. The death rate from tuberculosis has fallen rapidly in the general population group of the United States for several decades, but there remains nevertheless the sobering fact that in the age group from which college students are drawn, tuberculosis is still the chief cause of death. Pulmonary tuberculosis therefore becomes a major health hazard to college students. When one reads that 60 to 70 per cent of all tuberculosis patients in this country are in the advanced stage of the disease when the diagnosis is made, and when one realizes that it is an established fact that treatment at this stage of the disease is, on the whole, quite unsatisfactory, one must conclude that there is an enormous field for education and for saving time and lives in a well-conducted college program of tuberculosis prevention. The early lesion is the strategic point of attack, and this lesion cannot be discovered by the usual methods of searching for r les in the chest or for the bacilli in the sputum. Carefully-taken roentgenograms of the chest interpreted by a specialist in the field *will* result in the discovery of these early lesions.

We assume that the negative Mantoux test means absence of tuberculous lesions in the individual, and we

may therefore use this skin test to eliminate from the necessity of having chest X-rays all those who react negatively. From 15-60 per cent of the college students, depending upon the density of the population from which they come, will react positively to the tuberculin skin test, and roentgenograms of these chests will reveal the significant pulmonary lesions. This group of early lesions will include those who, though completely asymptomatic, need serious consideration and careful treatment if a future breakdown is to be avoided. At Oberlin College we make a practice of sending to the prospective freshman a brief statement regarding our tuberculosis program, and ask the parent to sign a request for the Mantoux test. The educational value of this measure is considerable. It serves to make the family tuberculosis-conscious and inform themselves of the value of early diagnosis in tuberculosis. It also protects the college from criticism in case an unusually severe skin reaction develops in response to the dose of tuberculin.

The college tuberculosis program ideally includes tuberculin testing all entering students followed by annual chest X-rays of all who react positively. Positive reactors should also be investigated to uncover possible association with active cases at home or on the campus. All suspicious lesions found by X-ray should be further studied and vigorously treated. Annually all negative reactors should be retested and X-rayed if the reaction has become positive.

The college health service director who carries out a complete tuberculosis preventive program may feel confident that he has not only saved a not insignificant number of students from breakdown, but has performed a large service in health education. His students and their children will not be satisfied with community programs inferior to the one he has experienced in college.

The emotional battles which the college student fights and loses are the source of greatest concern to the college physician. As a result of the breakdown of the American family, the adolescent's problems are thrown upon the college for solution and the physician finds himself in a more advantageous position than anyone else on the faculty to deal with these emotional maladjustments. All colleges should have the services of a well-trained psychiatrist on the campus. Very few institutions, however, have this facility available. The psychiatrist should be the center of a well-planned mental hygiene program, which should include education of the faculty in this field as well as treatment of the student. With a mental hygiene-conscious faculty, the students needing help can usually be brought to the physician for consultation before their difficulties have rendered them completely inefficient. A faculty member, particularly one who comes into close personal relationship with students, is in a position to note tendencies in behavior that precede complete emotional breakdowns. If a number of faculty members including deans, coaches, *etc.*, keep brief records of their observations and someone maintains a central file for these records, it helps in a large way to uncover incipient disturbances before the student becomes com-

pletely lost. Another method of uncovering potential emotional maladjustments in the stage when prophylaxis is still possible is to insert in the entrance personal history blank a few key questions, the answers to which, when reviewed by the psychiatrist, will indicate the students who need early help. Another method is to introduce in the entrance physical examination a brief psychiatric interview. Competition in intellectual, social and physical phases of life on the campus is keen throughout the four years. It is not to be wondered that the impact of these forces on a comparatively immature personality will most certainly give rise to conflicts in all who are not capable of making easy adjustments. The large bulk of cases that arise in this atmosphere can be classed as anxiety states, and the mild manic depressive disorders. Many of these can be handled by any wise and sympathetic advisor, but the mental hygiene program will not achieve its maximum usefulness unless a psychiatric-trained physician is the center of activities.

The eye health of college students has only recently come into the field of serious study by health service directors. It is estimated that about 400,000 students enter college annually and that 15 to 25 per cent of these students enter with serious visual defects. Presumably at college entrance, the students plan to follow a four-year course of study in which achievement may be conditioned by ability to receive mental stimulation from the printed page. That this problem has long been neglected makes it all the more important that the college try to find a solution as promptly as possible. Many difficulties, however, stand in the way of any rapid solution, since good eye health comes only as the result of many widely divergent factors. It involves psychology of vision, early and proper correction of visual defects, proper study facilities, and eye health education. It is difficult to incorporate in the general physical examination of all students a satisfactory test that will uncover defects of vision which, although minor, nevertheless interfere with the student's effectiveness. At one extreme is the simple test chart and

at the other is a complete ophthalmologic examination, expensive and time-consuming. As a result of study and research, some happy medium method will be worked out that can be used with the routine examination, and will safely single out those who may enjoy effective vision without further tests. It will definitely indicate those who need to have the complete ophthalmic examination, and wear a correction for their defects. The problem of proper study facilities is complicated by the fact that there is not yet complete agreement on the matter of proper intensity of light for easy reading, and by the fact that there is actually a difference in the amount of light that is ideal for different individuals.

The college student's vision problem stands in the same position which tuberculosis held ten years ago, and we look forward with confidence to a solution as satisfactory as that which the American Student Health Association's Tuberculosis Committee has offered in its field.

Rather rapidly, then, during the last fifteen years, the college health service has developed into an important branch of medical practice. It has passed through the stage of being an unwanted child, and has won the co-operation and respect of the whole medical profession. Within the past three years it has survived three nationwide, exhaustive surveys; one by the American Medical Association, one by the United States Office of Education, and finally, a most detailed study not yet published by the American Youth Commission. It has developed a program of prevention, education and cure that is essential to every educational institution of higher learning. It has become an important specialty, performing services for limited groups which would not be possible through uncoordinated agencies. To its staff it is currently attracting young physicians, particularly of the studious type, who may look forward to a career exclusively in this service, to a career of significant usefulness to a select group of young Americans who will become the leaders of their respective communities and of the nation.

Research As An Essential Function of Student Health Service*

E. Lee Shrader, A.B., M.D.†

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BEFORE undertaking the task of writing this address I reviewed as many of the *Proceedings* of this Association as I could find. I must confess this was prompted by a burning curiosity to learn the content of previous presidential addresses.

It seems that many of our presidents were very modest; for they have frequently apologized for their addresses

* Presidential Address, eighteenth annual meeting, American Student Health Association, Chicago, Illinois, December 30, 1937.

† St. Louis University.

or have approached their subjects with a linguistic air of humility. Needless so, it seems to me, for all but one of them have devoted their lives to student health work and have achieved unchallenged success in their chosen field. One of them, however, chose internal medicine for his major effort and only incidentally devoted a portion of his time to student health work. He is keenly aware of his deficiencies as he has told you once before and therefore feels that his impending apol-

ogy has real merit. I sincerely feel inferior to my predecessors and humbly beg your pardon for inflicting this address upon you.

Now that I have disabused your minds as to what is to follow, let us turn once more to the records of the past. In searching for the presidential addresses I became interested in other parts of the *Proceedings* and found them instructive; and I cannot resist the desire to give you a few of my impressions of these earlier meetings of this Association. They must have had excellent stenographic service, for impromptu remarks are fully recorded. The discussions so preserved to us were very lively and the frankness of the opinions expressed must have been as stimulating then as they are now.

Informality was an outstanding characteristic. In one session I recall that a representative of a new school made a good extemporaneous talk that seemed to please all those present. That institution was promptly then and there voted into the Association, and the program as promptly resumed.

The presidents' opinions are as frequently found scattered throughout the minutes, where they have been extemporaneously propounded at most propitious times, as they are in their formal addresses. Such informality could, of course, have been achieved only when the meetings were small. As the Association grows in size there is more formality and less of this delightful spontaneity both in the *Proceedings* and the presidential addresses. Of course, I am aware of the fact that our more recent *Proceedings* have not included discussions; but from my own observations, while excellent, they do not seem to have aroused the Association as a whole to as frank a verbal expression of their thoughts as in the past.

This is not due to any lack of enthusiasm, for in the past few years I have listened to, and participated in earnest, fluent, hotel lobby and hallway debates on student health problems; and I have often wished that these discussions could have had the Association for an audience. A large formal group seems to inspire many of us with stage fright rather than eloquence; for that reason this year part of our program will be devoted to round table conferences. In these smaller groups we hope tongues will be loosened and that these previously mentioned hotel hallway and lobby opinions can be made a part of the deliberations of the Association. I sincerely hope all who attend them will enter whole-heartedly into the spirit of the discussions and give utterance to your innermost feelings and convictions; for we meet to give inspiration to each other. Therefore, let us revive and intensify the spirit of the past for our own mutual enrichment.

In the earlier years of the Association's life, organization and administration occupied a prominent place in the programs. This was only natural in a new and rapidly expanding field. Out of these discussions there grew a desire for some standard form of organization to be adopted by all institutions; a hope which was cherished by many student health leaders even as late as the first Conference on College Hygiene. But the great variety

of conditions under which college hygiene programs have been born and under which it seems they must, for the present, continue to live, has made this a far distant future, if not a futile hope. Yet these discussions on organizations have served a useful purpose!

For organization is predicated on certain desirable activities. In other words, the functions of a health service were simultaneously considered in the deliberations on organization. And so, with the fading of the standard organization vision, there has been a clearer crystallization of the activities a health service should perform in a college community. The declarations of the second Conference on College Hygiene clearly defines our present views on those essential in a college hygiene program.

One of these to which the second Conference gave only a small amount of formal space in its report was research. This is an activity which would, naturally, be of interest only after more indispensable ones had been defined and accepted. However, this is not the first time this topic has been presented in our meetings. Ten years ago at our eighth annual meeting in 1927 it was emphasized by two papers on the program. Each approached the subject from different viewpoints.

One listed and briefly summarized a large number of original papers already published on subjects of great concern to the college hygienist.¹ It also outlined some broad possibilities for future investigation. This completed and contemplated research was concerned chiefly with the establishment of norms and the immediate health problems of the four year age span of the college student; all problems which properly do belong to, and should be investigated by student health workers; all problems of vital interest to the college hygienist which either do not interest or are too little understood by other specialties in medicine.

The other paper, by contrast, conceived research as the discovery at the college age level of preclinical syndromes forecasting the approach of far distant health hazards in the life of the individual; it foresaw the development of the ability of the college hygienist to predict the probability of premature degenerative disease; it implied the evolution of individual preventive programs contributing to longevity; rather than the investigation of the more immediate health problems of the college student.

This essayist states: "Vital statistics teach us some grim facts concerning the occurrence of such health disasters as heart disease, chronic nephritis, psychoses, tuberculosis, and cancer. Our health examinations of college men and women do not at present enable us to find or predict more than a small percentage of these ultimate health failures. Perhaps some of them, cancer for instance, will never be predictable or avoidable, even if pre-clinical evidence of their eventual arrival is made possible. But one cannot escape the belief that the thousands of college boys and girls now under observation are constantly giving us signs we cannot see and infor-

1. Research Opportunities in Student Health Work. H. S. Diehl, M.D., Presidential Address; *Proceedings of the eighth annual meeting of the American Student Health Association.*

mation we do not understand, and that with scientific imagination and patient research we will slowly acquire a new knowledge and technique that will enable us to recognize and decipher their symptoms codes that now vainly call our attention to distant, approaching poor health. Some day we will be sensitive to the unsuspected warnings of impending though distant health disaster that are brought to us every day in our programs of periodic health examinations of students. The significance of this hope and its bearing on the importance of pertinent research stands out with vivid impressiveness when one takes the diagnosis made on any thousand new students and compares those diagnoses numerically with the expectancies established by vital statistics. One individual out of 25 is sooner or later diagnosed as mentally sick. At least half of these become permanently psychotic, neurotic, or both. It is estimated that there are twice as many cases of disturbed mental health that are never discovered. Where are these 40 or more prospective cases in the group of 1000 you have examined? How may they be identified? One man out of 10 and one woman out of 7 past the age of 45 dies of cancer. Is there any way to find these possibilities in this group and save them? Who were the eventual kidney cases, heart cases and gastric ulcers among the students you classified as "normal" or "negative" in your examination of a thousand students?"²

Since that date, four presidential addresses to you have mentioned research. Three of these have discussed it from this latter viewpoint, the solution of the distant future health problem. A thought, then, which has intrigued the minds of many of us with its possibilities has tantalized us to the extent of giving it verbal expression. A thought which, to date, has not been productive of concrete results, and we naturally inquire, why has not more progress been made in a realm so rich in possibilities?

"From a biological viewpoint, functional changes from the median must be conceived as preceding structural deviations. Whether such disturbances originate as biochemical, or in a more gross physiological way, is still speculative. Speculative, however, only because of a lack of definite evidence to support our thought. We do not know exactly how or when persistent median functional deviations will or do evolve into definite pathology. Our ability to visualize and classify impending clinical trends has not kept pace with our diagnostic art. We have pushed back the frontier of illness from the gross to those more subtle asymptomatic and finally to the hazy and as yet ill-defined meeting ground of structure and function. We are still structurally, not functionally-minded. We are still more interested in illness, and are only now become health-conscious. Our clinical methods of investigating disease, or health if you wish, are still designed to disclose established pathology. They need

more physiological refinement to clarify the twilight zone where function and structure meet."³

Seldom has medicine approached the solution of a clinical problem from the physiological viewpoint. Almost invariably a thorough investigation of far-advanced disease has been successful in elucidating the intermediate stages; and in like manner a study of the latter has clarified the pathological processes of the earlier manifestations. It is logical that medical clinical investigation should have proceeded in this way. It was much easier to "back-track" one single pathological process than to accurately follow one faint physiological trail among a maze of many faint trails leading to many morbid processes.

It is strange, though, in universities where there is a medical school that the college hygienists and the medical faculty have not more often found mutual interest in such disease study. For it seems that medical men, trained in physiological medicine on the one hand and in clinical pathology on the other, could have focused their minds on some of the future degenerative diseases so each could have helped to guide the other. The medical school could also be of invaluable help in the provision of laboratory facilities and other equipment which a health service rarely possesses.

But strange as this may appear, the explanation seems obvious. Neither group has clearly visualized its opportunities. In the past, medical schools have taught pathology and properly so; but they have been generally indifferent to teaching clinical physiology. More recently, however, they have shown an interest in positive health. Occasionally now we are seeing health clinics organized in dispensaries alongside of medical and surgical clinics. This bright spot in a cloudy picture indicates an awakening interest in pre-clinical syndromes of future health hazards. Let's hope it will continue to grow. Likewise, school administrators and all too often, student health directors, have seen the vision all too faintly or not at all. Too frequently they have planned and established health services as though health knowledge were static and there were no new worlds to conquer. It is no wonder then, that the health service budget, amount and quality of the personnel and the physical facilities provided have often served only to meet the immediate health needs of the student body. There has been no allowance of funds and time, no training of personnel or provision of facilities for investigation. Only the routine performance of duties such as health teaching, health examinations and the supervision of the care of illness, is possible. The advancement of health knowledge and the service that could thus be rendered to humanity by prevention of future illness and promoting longevity, have been forgotten. Is it any wonder then that our periodic health records are literally littered with notations and findings too incomplete, conflicting or inconclusive to be understood or classified? If clinical physiological medicine, as exemplified by student health services, is to play its part

2. Periodic Health Examinations as a Means of Research, Thomas A. Storey, M.D., Ph.D.; Proceedings of the eighth annual meeting of the American Student Health Association.

3. A Student Health Opportunity, E. Lee Shrader, A.B., M.D.; Presidential Address; Proceedings of the seventeenth annual meeting of the American Student Health Association.

in this integration of disease, opportunities must be provided that will permit concrete contributions to the definition of pre-clinical syndromes of future health hazards and their prevention.

As an Association, it seems to me we might aid this physiological pathological integration in the study and solution of disease problems. For just as the coöperation of a medical school faculty and a student health service staff gives promise, so does the idea of two co-operating Associations give promise of more successful research. We have already established a few precedents which, while not astounding to the medical world, have borne fruit. The study of the longevity of athletes fostered by this Association and the Metropolitan Life Insurance Company, and our tuberculosis program in conjunction with the National Tuberculosis Association have aided and given impetus to the study of disease at the college age with a view to the future health of the individual. More recently, we have undertaken a similar study of eye diseases with the National Society for the Prevention of Blindness. This latter project is too new to risk any prediction as to its achievement. But in these ventures we are combining the best talents of both clinical physiology and pathology. A combination which should be most effective.

Furthermore, this Association could stimulate original investigation by the mere definition of it as an essential activity of a student health service. Essential, because it would contribute information useful for the teaching and clinical preservation of health: the two most essential reasons for the existence of a student health service. It would complete and round-out a health program. It would also tend to stimulate school administrators and student health service directors to select an adequate and qualified staff and to allocate budget and time for such a function.

There could be no better way for this Association to give recognition and definition to research as a legitimate and prime activity of a health service than to establish a standing research committee. If we grant that research is a primary function of a student health service such a committee would be compatible with the rest of our Association organization, for we have standing committees to represent other established student

health service functions. It has been suggested that our present standing committees could well perform this duty; and so it would seem in theory, but in practice they have become essentially program-planning committees for our national meetings. Furthermore, they have not had a sufficient permanency of personnel to maintain a continuity of effort. Nor would they be able to emphasize research as a prime student health service activity. They should and probably will continue as program committees.

Once before a president of this Association ventured to suggest that a research committee be appointed. And again I wish to recommend it to you, for it would serve to:

1. Define research as a primary function of a health service.
2. Impress on colleges the broader community aspects of their health programs.
3. Promote the collaboration of physiological and pathological medicine as individuals and collectively as associations in the study of disease.
4. Stimulate the accumulation of *new and more accurate* health knowledge for the improvement of health teaching and its clinical application to disease prevention.
5. Foster a more universal *concrete* realization of the research spirit on health problems.

Such a committee should have as adequate a representation of both college hygiene and clinical medicine as is possible in its membership. The appointments should not be for less than five years, and should be so staggered that a continuity of activity would be guaranteed. Among other duties it should study and investigate all proposed coöperative disease studies between this Association and other associations and advise the council as to their feasibility and the manner in which they should be conducted. It should coöperate with the other standing committees in promoting research projects in their respective fields.

It might well serve as an advisory body to student health services seeking information on proposed investigation, thereby preventing duplication and unfruitful labor.



Proceedings of the
Eighteenth Annual Meeting
 of the
AMERICAN STUDENT HEALTH ASSOCIATION

Stevens Hotel, Chicago, Illinois

December 30-31, 1937

Business Session

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 Dr. Helen B. Pryor, *Chairman*

Informational Hygiene

Prof. T. Bruce Kirkpatrick, *Chairman*

Hygiene of Physical Activities

Dr. T. M. Storey, *Chairman*

Health Problems of College Women

Dr. Ruth M. Collings, *Chairman*

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Dr. Ruth Boynton		(2)	

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Training Personnel

Dr. W. E. Forsythe	(4)	Dr. K. Frances Scott	(2)
Dr. H. L. Marshall		(2)	

* The number in parenthesis indicates the duration of appointment.

THURSDAY, DECEMBER 30

Session I

9:30 a. m.—Registration.
 10:00 a. m.—

- A. Call to order.
 Secretary's Report.
 President's Address—Dr. E. Lee Shrader.
 Appointment of Nominating Committee.
- B. Program of the Committee on Health Service.
Chairman, Dr. Charles E. Shepard, Stanford University.
 The Meaning of Athletic Hypertrophy in University Students—Dr. Dan G. Stine, University of Missouri.
- C. Program of the Committee on the Hygiene of Physical Activities.
Chairman, Dr. Lee W. Milford, Clemson Agricultural College.
 Does Our Physical Education Program Function as Health Education?—Dr. W. H. York, Princeton University.
- D. Program of the Committee on Tuberculosis.
Chairman, Dr. Charles E. Lyght, Carleton College.
 After the Diagnosis—What Next?—Dr. J. A. Myers, University of Minnesota.

Association Luncheon—12:30

Speaker—Father Schwitalla, Dean, St. Louis University Medical School, St. Louis, Missouri.
 "The Student Health Service in the University."

Session II

2:00-3:30 p. m.—Round Table Sessions.

- A. Committee on Health Service.
Chairman, Dr. Charles E. Shepard, Stanford University.
 Problem of Venereal Disease Control in College Students.
 - B. Committee on Hygiene of Physical Activities.
Chairman, Dr. Lee W. Milford, Clemson Agricultural College.
 Should Athletic Trainers Be under the Supervision and Control of the Team Physician?
- 3:30-5:00 p. m.
- C. Committee on Organization and Administration.
Chairman, Dr. Joseph H. Kler, Rutgers University.
 The Ideal Health Service.
 - D. Committee on Informational Hygiene.
Chairman, Dr. W. H. York, Princeton University.

6:30 p. m.—1937 Council Dinner.

FRIDAY, DECEMBER 31

Session III

9:00 a. m.—Program of the Committee on Eye Health—*Chairman*, Dr. Bradshaw, Oberlin College.
Newer Knowledge of Eye Health—Dr. W. L. Benedict, Mayo Clinic, Rochester, Minnesota.

9:30-11:00 a. m.—Round Table Sessions.

A. Committee on Health Problems of College Women—*Chairman*, Dr. Helen B. Pryor, Stanford University.

B. Special Committees.

Tuberculosis—*Chairman*, Dr. Charles E. Lyght, Carleton College.

Eye Health—*Chairman*, Dr. R. W. Bradshaw, Oberlin College.

11:15 a. m.—

A. Business Meeting.

Report of Council Meeting.

Report of Nominating Committee.

Report of Local Sections.

Report of Tuberculosis Committee.

12:30 p. m.—1938 Council Luncheon.

Session IV

2:00 p. m.—

A. Program of the Committee on Health Problems of College Women—*Chairman*, Dr. Helen B. Pryor, Stanford University.

The Use of the Fluoroscope in Examination of College Students—Dr. Ruth E. Taylor, University of Chicago.

Discussion: Dr. Grace Hiller, Dr. Glenadine Snow.

B. Program of the Committee on Departmental Organization and Administration—*Chairman*, Dr. J. H. Kler, Rutgers College.

A Nation-wide Survey of College Health Work—Dr. H. S. Diehl, University of Minnesota, Dr. Charles E. Shepard, Stanford University.

C. Program of Committee on Health Service—*Chairman*, Dr. Charles E. Shepard, Stanford University.

College Mental Hygiene Methods—Dr. H. D. Palmer, University of Pennsylvania.

D. Program of Committee on Informational Hygiene—*Chairman*, Dr. W. H. York, Princeton University.

The Value of the Individual Health Record in Hygiene Teaching—Dr. H. D. Lees, University of Pennsylvania.

FINANCIAL STATEMENT

December 15, 1937

Receipts

Balance brought forward	\$1,365.22
Dues for 1937 from 126 member institutions	1,260.00
One reinstatement (Iowa State Teachers College)	10.00
Dues for 1935 and 1936 (Michigan State Normal School)	20.00
Dues for 1938 from two institutions	20.00
Proceedings sold (14)	24.50

\$2,699.72

Disbursements

Subscriptions to JOURNAL-LANCET (145)	\$ 217.50
Postage	61.00
Secretarial help	50.00

Exchange	3.41
Refund (Proceedings not mailed)	1.75
Refunds to Sections:	
New York Section	\$37.50
Northwestern Section	10.00
South Central Section	22.50
Pacific Coast Section	5.00
Southern Section	17.50
Mid-Atlantic Section	27.50
Indiana Section	10.00
Michigan Section	22.50
Southwestern Section	15.00
Ohio Section	32.50
Pennsylvania-New Jersey	47.50
North Central Section	20.00
Rocky Mountain Section	5.00

272.50

Stationery and printing 1936 and 1937; envelopes, programs, etc. 59.10

Convention Expense

(Stevens Hotel)—

Council dinner and council

luncheon 60.23

Guest tickets 5.00

Tips, telephone, etc. 18.23

Signs printed 3.00

Projector rental 6.00

Registration clerk 10.00

Travel expense, secretary 23.35

125.81

Proceedings—1936:

350 Proceedings 268.00

Boxes 32.50

Labels 3.50

Postage and express 43.80

347.80

\$1,138.87

Balance

\$1,560.85

RUTH E. BOYNTON, M.D., *Secretary-Treasurer*.

BUSINESS MEETING

Thursday, December 30, 1937

Report of the Secretary-Treasurer

The following report of the Council Meeting of December 30, 1936, was read and approved:

The place of holding the next annual meeting was discussed. Dr. Storey and others expressed the opinion that they felt the need of meeting with the National Collegiate Athletic Association and the American Football Coaches Association was not of primary importance in deciding on the location for our meeting. After further discussion it was moved by Dr. Sundwall and seconded by Dr. Hickernell that the next annual meeting be held in Chicago. Dr. Shrader then asked members of the Council for an expression of opinion regarding the type of meeting. Dr. Shrader suggested that it might be well to make the annual meeting a combination of a meeting with formal papers and informal round table discussions. The members of the Council were very much in favor of trying out such a plan. It was moved by Dr. Kler and seconded by Dr. Scott that the Executive Committee make use of the suggestion to have the program include both the formal and informal meetings for the next annual meeting.

Dr. Shrader presented to the Council the question of renewing our relationship with the JOURNAL-LANCET for another year. It was the experience of the Council that this was a very satisfactory arrangement, and it was moved by Dr. Ferguson and seconded by Dr. Canuteson that it be continued. Motion was carried.

The Secretary reported that there are a total of 143 member institutions in the Association, 139 of which have paid their

annual dues. Applications for membership have been received from six institutions.

REPORT OF THE NOMINATING COMMITTEE

The nominating committee, consisting of Dr. D. F. Smiley, Dr. Glenadine Snow, and Dr. L. M. Hickernell, presented the following ballot for officers of the Association for 1938:

President—Dr. Charles E. Shepard, Stanford University, Palo Alto, California.

Vice-President—Dr. J. P. Ritenour, Pennsylvania State College, State College, Pennsylvania.

Secretary-Treasurer—Dr. Ruth E. Boynton, University of Minnesota, Minneapolis, Minnesota.

Members of the Council for two years, term expiring December, 1939—Dr. H. L. Marshall, University of Utah, Salt Lake City, Utah; Dr. G. T. Wilhelm, University of Tennessee, Knoxville, Tennessee; Dr. Lee H. Ferguson, Western Reserve University, Cleveland, Ohio.

This report was accepted and the Secretary requested to cast a unanimous ballot for these officers.

BUSINESS MEETING

Friday, December 31, 1937

Report of Council Meeting:

The following report and recommendations of the Advisory Council of December 30, 1937, were received and approved.

The Council recommended that membership be granted the following:

Nazareth College, Nazareth, Michigan, Sisters of St. Joseph.

Fredericksburg State College, Fredericksburg, Virginia, Dr. Mildred E. Scott.

Mary Baldwin College, Staunton, Virginia, Dr. Kenneth Bradford.

Alabama Polytechnic Institute, Auburn, Alabama, Dr. B. F. Thomas.

Wilberforce University, Wilberforce, Ohio, Dr. Harry M. Lackey.

Iowa State Teachers College, Cedar Rapids, Iowa, (Re-instated.)

The Council voted to recommend to the membership of the Association participation in the observance of National Social Hygiene Day, February 2, 1938.

A report from Dr. William F. Snow and Miss Strachan on the distribution of the Proceedings of the Second National Conference on College Hygiene, held in Washington, D. C., December, 1936, was read. The Council voted to purchase sufficient copies of this report so that one might be sent to the President of each member institution.

The Council recommended that in order to insure more continuity of work the members of the special committees—Tuberculosis, Eye, Local Sections, Editorial and any future special committees—be appointed for four years, one-half of the committee to be appointed every two years.

The Council recommended that the Association purchase sufficient reprints of Father Schwitalla's paper presented at the Association Luncheon to send two copies to the representative of each member institution, with the suggestion that one copy be sent by the Health Service Director to his President. The Council also recommended that reprints of this paper be sent to officers of the Local Sections with the suggestion that it be read at the sectional meeting.

The Council recommended that it be made a routine order of business of the Council to consider former members of the Association who have retired from active student health work to whom letters of recognition of their work in the Association be sent by the President.

Also recommended the appointment of a Special Mental Hygiene Research Committee to study the present mental hygiene work in the institutions in the Association.

It was suggested by the Council that the minutes of the business meeting of the Association be published in THE JOURNAL-LANCET as soon after the meeting as possible.

It was also suggested that the Proceedings of the Meeting be published immediately after the meeting rather than waiting until the end of the year as has been the custom.

Dr. Smiley reported on some of the difficulties in the reorganization of local sections. The details of making any adjustment were left to Dr. Smiley.

RUTH E. BOYNTON, M.D.,

Secretary-Treasurer.

Book Notices

HERNIA: THE INJECTION TREATMENT

Injection Treatment of Hernia, by CARL O. RICE, M.D., F.A.C.S.; assisted by HAMLIN MATTSON, M.D.; 1st edition, green cloth, gold-stamped, 250 pages plus bibliography and index, 83 illustrations; Philadelphia: The F. A. Davis Company: 1937. Price, \$4.50.

Hernia, writes Dr. RICE, who is instructor in surgery in the University of Minnesota Medical School, was cured in 1843 by GEORGE HEATON, using a method similar to that which RICE discusses in this monograph. But RICE's book is the result of much practical clinical work, for he inaugurated the hernia clinic at the Minneapolis General Hospital in 1932, primarily for trying the ambulant treatment of hernia on patients who were poor surgical risks. His book classifies hernia, describes the anatomy of the abdominal wall, traces the etiology of hernia, discusses its diagnosis, and then proceeds directly (after considering the truss) to a consideration of the injection treatment. The bibliography refers to "The Ambulant Treatment of Hernia" by ARTHUR F. BRATRUD, M.D., in the June 1934 issue of THE JOURNAL-LANCET and "The Ambulant Treatment of Hernia" by BRATRUD in the December 1933 issue of THE

JOURNAL-LANCET. Also referred to are E. R. HARE's "A Study of the Abdominal Wall in Relationship to Hernia" in the May 1916 issue of THE JOURNAL-LANCET; and R. R. CRAUMER's "Report of a Case of Mesenteric Thrombosis Resulting From the Injection Treatment of Hernia" in the October 1935 JOURNAL-LANCET. The book is a very good text on the subject, with a fine background of experience and familiarity with the condition of hernia.

MEANS ON THE THYROID

The Thyroid and Its Diseases, by J. H. MEANS, M.D., and many collaborators; 1st edition, green cloth, gold-stamped, 578 pages plus index, 73 figures, chapter-end bibliographies; Philadelphia: The J. B. Lippincott Company: 1937. Price, \$6.00.

This is not strictly a textbook, for it relates the experience of Dr. MEANS and many others at the thyroid clinic of the Massachusetts General Hospital in Boston. It is, nevertheless, a very valuable work, because the workers strove toward two ends: they endeavored as much as possible to treat and care for the patient, and they also tried to learn from his condition something new about the disease entity. Dr. MEANS, who is the Jackson professor of clinical medicine in Harvard University, and chief of the medical services of the Massachusetts General Hospital, has given the profession a useful and authoritative volume on the diseases of the thyroid gland.

The JOURNAL LANCET

Represents the Medical Profession of
MINNESOTA, NORTH DAKOTA SOUTH DAKOTA and MONTANA

The Official Journal of the

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Medical Association of Montana

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MINNEAPOLIS, MINN., FEBRUARY, 1938

THE AMERICAN COLLEGE OF PHYSICIANS

The American College of Physicians, in the columns of this issue of THE JOURNAL-LANCET, bows to its readers through a series of papers from College members in the Dakotas, Montana, Minnesota, and nearby states. Perhaps the work of the American College of Surgeons, which first came into the field, is better known than that of the American College of Physicians. These great colleges never started out to synchronize; both desire to leave to the American Medical Association the field of unifying and advancing the general purposes of all the specialties in our medical guild.

The American College of Surgeons developed in Chicago through the inspiration and efforts of the late Dr. Franklin Martin; the American College of Physicians, beginning in New York in 1915, started to expand in about 1919, through the untiring energy of the late Dr. Frank Smithies, likewise of Chicago. He became secretary-general of the College, and later its president. The surgeons got off to a running start with the great objective of standardizing our American hospitals. This was eminently practical, since most surgery is done in our hospitals. The zeal for geographical distribution likely outweighed the application of the stringency in entrance requirements, which both Colleges now realize is most necessary.

The American College of Physicians floundered about for a decade and a half without a very definite objective;

but building all the time a closely-knit organization, that year by year put on a general program and a meeting of excellent practical qualities. It was soon noted, however, that as far as programs were concerned, a great bevy of special societies, state and national, with not a few regional groups, was also producing very attractive programs, and giving outlets for reporting research work wherever it developed. The American College of Physicians, never having cultivated must external propaganda (hospital or public health), gradually noted its opportunity to step into the field of maintaining the highest individual membership attainments possible. Out of this, with the coöperation of the Section of Medicine of the American Medical Association, has come the American Board of Internal Medicine. This is only a beginning. The two-volume report of the American Foundation (whatever else it may connote) shows clearly the problems facing medicine in terms of specialism, and the training of specialists. The chairman of the original Board for Certification,* Dr. Walter Bierring of Des Moines, and his co-workers, deserve the greatest credit for assuming a task fraught with all the subtleties of scientific and personal, not to mention political and diplomatic exploration. Many good men will misunderstand some of the Board's rulings, but where there are such they must remember that rules of some sort have to be drafted; and what are rules if they are to be mercilessly exacted?

Where quite rigid rules are to be applied for certification, it follows that the College must, as the years progress, devise practical means within the U. S. A. and Canada for advancement in training, tutelage and experience, of those who appropriately evidence their capacity to enter the specialty of internal medicine or any of its allied branches. Much remains to be worked out in terms of these plans; but no one aware of the type of leadership the College has developed and sponsored need have any doubt that it is equal to the task.

The next meeting† of the American College is early in April in New York City. It has been suggested that yearly, where the College meets, a period of special lectures and clinics shall be arranged. These, if given at nominal cost to those attending, may be made very popular; and would provide a beginning in developing in America some of the graduate instruction our country is now abundantly qualified to offer.

E. L. T.

* The following represents the present American Board of Internal Medicine. It will be noted that it is made up of representatives of the A. M. A. and A. C. P. According to our present roster all are members of the A. C. P.

Chairman, Walter L. Biering, Des Moines, Iowa.
Reginald Fitz, Boston, Mass. (A. M. A.)
Ernest E. Irons, Chicago, Ill. (A. M. A.)
John H. Musser, New Orleans, La. (A. M. A.)
David P. Barr, St. Louis, Mo. (A. C. P.)
Jonathan C. Meakins, Montreal, Que. (A. C. P.)
William S. Middleton, Madison, Wis. (A. C. P.)
O. H. Perry Pepper, Philadelphia, Pa. (A. C. P.)
G. Gill Richards, Salt Lake City, Utah (A. C. P.)

† See special digest of the preliminary announcement, in this issue, on page 59.

RESEARCH AND PRACTICE

"You fellows have the same problems I have: how to keep up with research and at the same time earn a living." So spake Charles F. Kettering, vice-president of General Motors and director of research. Then he proceeded to set up an endowment to pay a research man to keep up with what was going on in medicine and to explain it to the Dayton doctors in weekly meetings.

The thought is not new to the doctor who has always found it necessary to apply himself in this dual capacity, but the publicity given this statement in the December *American Magazine* and January *Reader's Digest* will make for a better understanding.

How universal the practice is in other cities, we do not know; but in Minneapolis for more than 25 years the custom of the county society has been to hold, in addition to the monthly meeting, weekly noon-day meetings where the members may learn through lectures and demonstrations the newest discoveries and methods of procedure. The program committee, in conjunction with the executive, is endowed with power to secure research workers to speak at these assemblies; and, even though all members cannot attend, a goodly number continue to take advantage of such facilities as are afforded them.

A. E. H.

ALLERGY AND THE FOOD AND DRUGS ACT

In the recent prosecution of a well-known manufacturer of cheese products for alleged violation of the Pure Food and Drug Act of 1906, the Federal Food and Drug Administration has attempted to extend the interpretation of the law for the benefit of allergic individuals. Examination of packages of a brand of processed cheese purporting to be a variety of old cheese revealed cayenne pepper as an adulterant. The Government charges that the cheese is in fact largely new cheese, seasoned with a certain amount of Cheddar cheese and cayenne pepper, added to impart the "bite on the tongue" expected of an old cheese. If the charge is true, then the manufacturer is guilty of "misbranding," which is specifically defined in the Food and Drugs Act and is regarded as a form of adulteration.

The Government charges further that the presence of concealed red pepper constitutes a violation of that section of the law which states, "If it contains any poisonous or other added deleterious ingredient which may render such article injurious to the health." In support of this charge the Government has introduced testimony to the fact that an indefinite portion of the population is allergic to pepper, and contends that since the label does not indicate the presence of pepper, some individuals might unwittingly suffer injury as a result of its consumption. This effort on the part of the Food and Drug Administration to protect the public through law enforcement is commendable. The law, however, has unfortunate limitations which should be eliminated. For example, there is the joker of the "distinctive name" clause. Under this clause the manufacturer could have given his product a distinctive name such as *Three Car Spread*, or other such meaningless designation, and the addition of pepper could not have been construed as a violation of the law. The writer has personally seen a patient who suffered shock of such severity that life hung in the balance for several hours from consuming only two spoonfuls of a cereal product bearing a "distinctive" name. This product, although the label did not reveal it, contained linseed meal to which the consumer in this instance happened to be exquisitely allergic. Many individuals are also allergic to common drugs such as aspirin. Such drugs are often concealed behind some distinctive trade name.

Any revision of the Food and Drugs Act should certainly eliminate the "distinctive name" joker in the present law. It should without equivocation require all food as well as drugs to be labeled to show completely what it contains. The present Congress has under consideration a proposed New Food and Drugs Act. The medical profession has more than a selfish interest at stake in the provisions of this proposed enactment.

R. V. E.

Societies

SCIENTIFIC PROGRAM OF THE MINNEAPOLIS CLINICAL CLUB

Meeting of November 11, 1937

D. D. Turnacliiff, M.D., Presiding

NEGLECTED TRANSVERSE (BACK) PRESENTATION

A Case Report

ROY E. SWANSON, M.D.
MINNEAPOLIS, MINNESOTA

Transverse presentation occurs in less than one per cent of labors. Under modern prenatal care, it is usually recognized and corrected before labor has started or has progressed too far. It represents an error in polarity, the long axis of the fetus lying obliquely or transversely to the long axis of the mother. The shoulder is usually the presenting part, the back, side or abdomen being exceedingly rare.

The most important causes of this abnormality are:

1. Contracted pelvis
2. Obstructive tumors
3. Multiple pregnancy
4. Placenta praevia
5. Multiparity, hydramnios and premature labor
6. Abnormal uterus (Bicornis, arcuatus and septate)
7. Fetal monstrosities
8. Accidental

The results of labor are usually disastrous to the fetus and frequently to the mother. Spontaneous delivery rarely occurs. These cases are always pathologic, and require some type of operative delivery that tests the skill and judgment of the attendant.

In the unrecognized case, the labor usually starts with weak and irregular pains. The membranes rupture early, and since there is no presenting part blocking the pelvis, all the amniotic fluid drains away. The uterus soon applies itself firmly to the fetus and then goes into a state of passive contraction. At this stage, hours may elapse with no progress. The pains eventually become violent and within a short time the uterus goes into a state of constant contraction with no appreciable interval. The shoulder becomes impacted, the lower uterine segment becomes excessively thin and uterine rupture imminent. If the uterus does not rupture, labor soon ceases and the now infected woman dies of sepsis. If rupture occurs she dies of shock and hemorrhage.

The treatment may be divided into three parts:

A. In pregnancy. The polarity is changed by external version and attempts made by means of pads, posture and corsets, to maintain its position. At this time the etiology is studied with a view to determine the method of delivery. If a longitudinal presentation cannot be maintained or other causative factors indicate that delivery from below cannot be accomplished safely, elective section should be done.

B. Early in labor, external version may be done if the membranes are intact. If this is impossible, expectancy is not permissible. If delivery from below is not contraindicated, a Voorhees bag is inserted, extra ovular, and labor allowed to progress. As soon as the bag is expelled, internal podalic version followed by extraction, if indicated, is done. If delivery from below is contraindicated, low cervical section is the method of choice.

C. Late in labor, neglect has changed the picture. Section is contraindicated and if absolutely necessary, Porro hysterectomy is done, usually with disastrous results. Deep anesthesia and the use of adrenalin to relax the contraction ring, may permit delivery by internal version. The danger of rupture of the uterus is great. The baby is usually dead and destructive

operations on the baby may have to be done. Decapitation is extremely difficult. Embryotomy is likewise difficult and dangerous. Careful examination of the birth canal including the cavity of the uterus must be done after any of these procedures.

Case Report

This case is reported because of the extreme rarity of lumbar presentation.

Mrs. W., age 34, Grav. II, Para I, due Nov. 4, 1937, was brought into Abbott Hospital by car from the country Oct. 4, 1937, at 4:30 p. m. Her membranes ruptured 120 hours (5 days) Sept. 30, 1937, previously. She has had mild and irregular pains. The day following rupture of the membranes, her local physician did a rectal and could feel no presenting part. He then did a sterile vaginal, and could find no presenting part. Following this examination, she bled about $\frac{1}{2}$ cup of blood. No progress was made; the patient was brought to the hospital.

On admission, she appeared tired and anxious. Temp. 99°, pulse 90. The bladder and bowel were emptied; urine showed a trace of alb., sugar 1+, sp. gr. 1.016 and 20-30 pus cells per field. Hgb. 68%. Physical examination was normal except for the abdomen and pelvis. The abdomen is smaller than an 8 months' pregnancy. The uterus is tender and very irritable and is firmly contracted around the baby. The baby lies transversely with the head to the right. Rectal examination shows no presenting part within reach of the finger and the cervix feels about 4. Pelvic measurements were adequate and no pelvic tumors can be found. The fetal heart is good.



Fig. 1. Roentgenograph showing baby lying transversely in the uterus, with cranium to the right. Rectal examination showed that there was no presenting part within reach of the finger. Cervix felt about 4. Uterus tender, irritable, and firmly contracted about the baby.

X-ray examination confirms transverse position with the back presenting.

Consultation was had confirming the above findings.

Under deep anesthesia (gas ether) thorough vaginal and perineal preparation was done. $\frac{1}{2}$ cc. adrenalin was given sub-

cutaneously. The examining hand was introduced into the vagina and the cervix was found to be complete. The internal hand was gently inserted into the uterus posterior to the back, and a foot was grasped. Gentle traction allowed version to be completed and an easy extraction was done. The baby was alive.

The placenta was removed and a careful exploration of the uterus was done. No rupture found; no excess bleeding. Ergot and pituitrin were given. The patient returned to bed in good condition and after a febrile course (102°) of five days, made a rapid recovery and was discharged on the tenth day.

This case illustrates the typical course of labor in transverse, and is of special interest since it was a true transverse presentation, which is exceedingly rare.

Discussion

Dr. C. J. EHRENBURG: I do not believe there is anything to add to this presentation. I think we have all seen a number of transverse cases and, as Dr. Swanson mentioned, with the baby usually presenting the shoulder. I have never seen a picture of a foetus that was distinctly transverse like this with the back presenting. I want to compliment Dr. Swanson on the result he got, with what he had to start with.

Dr. ROY E. SWANSON: I feel that we were very lucky in the outcome of this case. Adrenalin certainly is a great aid in relaxing the uterus.

CHIP GRAFTS IN ORTHOPEDIC SURGERY SHOWN BY MEANS OF NUMEROUS LANTERN SLIDES

MYRON O. HENRY, M.D.
MINNEAPOLIS, MINNESOTA

The author presented his technique for spinal fusion using multiple chip grafts. Two operating teams are needed for this method of spinal fusion, one team removing chip grafts from the cortex of the tibia no larger than the finger nail while the primary operating team is preparing the spinal bed. The spinal bed is prepared by use of hand chisels without hammering upon the spine. In tuberculosis of the spine at least two (usually three) vertebrae on each side of the tuberculous focus are fused together. By this method six to eight vertebrae can be fused in less than an hour. Care is taken not to enter the medullary cavity of the tibia and only cortical chips are used. Illustrative cases were shown where the tuberculous process had remained healed out completely for over twelve years. The author's method of spinal fusion requires few special instruments, is almost devoid of shock, and should not require more than one hour's operating time. The chip graft method reduces the danger of surgical shock and fat embolism in spinal fusions.

The chip graft method of spinal fusion was demonstrated in cases of spondylolisthesis, structural scoliosis, congenital malformations of the spine, old compression fractures with deformity and pain, and cases of recurrent back strain.

The wide range of usefulness of chip grafts was demonstrated in cases of congenital dislocation of the hip where a roofing (or shelf operation) was required. Also in cases of deformity of the lower extremities where opening osteotomies were performed filling the defect with chips and lengthening the deformed bone instead of removing a cuneiform piece and increasing the shortening. In arthrodeses of large joints chip grafts were used to augment and hasten fusion. In the surgical treatment of benign bone tumors such as cysts, giant cell tumors, osteitis fibrosa and benign types of chondrocarcinoma, bone chips were employed to fill the tumor cavity. Chip grafts are easily obtained in large quantities without special instruments.

Discussion

Dr. C. J. EHRENBURG: I have had occasion to take care of a woman who has had a spinal fusion. I think it was for a sacralization of the 5th lumbar. Some question came up after she got married and became pregnant, as to whether or not the fusion would have any effect on her delivery, inasmuch as the lumbosacral joint was rigid. She had two babies and both of

them delivered normally and without any difficulty. She had no difficulty or pain during the time she was carrying her babies, or after the babies were delivered.

LAWRENCE R. BOIES, M.D.,
Secretary

AMERICAN COLLEGE OF PHYSICIANS

DIGEST OF THE PRELIMINARY ANNOUNCE- MENT OF POST-GRADUATE COURSES FOR ASSOCIATES AND FELLOWS (only*) FROM MARCH 21 TO APRIL 2, 1938.

- Course 1: General Medicine, at the Harvard Medical School, Boston.
- Course 2: Neuropsychiatric Factors in Internal Medicine, Columbia University College of Physicians & Surgeons, New York City.
- Course 3: Diseases of Metabolism, and Practical Problems in Dietetics, The Mount Sinai Hospital, New York City.
- Course 4: General Medicine, Columbia University Faculty and the Mount Sinai Hospital, New York City.
- Course 5: General Medicine, Columbia University: the New York Post-Graduate Medical School & Hospital, New York City.
- Course 6: Cardiovascular Diseases.
- Course 7: Gastro-Intestinal Diseases.

(Courses 6 and 7 will be given separately, both in Philadelphia, by the University of Pennsylvania Graduate School of Medicine.)

* Full details have been sent to all fellows and associates of the American College of Physicians.

THE SIOUX VALLEY MEDICAL ASSOCIATION

43rd Annual Session

SIOUX FALLS, SOUTH DAKOTA
January 19 and 20, 1938

The 43rd annual session of the Sioux Valley Medical Association opened on Wednesday, January 19, at 9:00 A. M., with a neurosurgical clinic given by Dr. A. W. Adson, chief of the neurosurgical department of the Mayo Clinic, and president of the Minnesota State Medical Association. At 10:00 A. M., Dr. C. N. Hensel, St. Paul, associate professor of medicine in the University of Minnesota, spoke on "The Irritable Heart, With and Without Valve Lesions." At 10:45 A. M., Dr. A. A. Werner, St. Louis, lectured on "The Anterior Pituitary-Gonad Relationship in the Female, with Clinical Application." At 2:00 P. M. on January 19, Dr. Kenneth A. Phelps, Minneapolis, chief of the bronchoscopy department of the University of Minnesota Medical School, spoke on "The Value of Bronchoscopy in the Diagnosis and Treatment of Pulmonary Tuberculosis." At 2:45 P. M., Dr. Adson lectured on "The Causes and Treatment of Chronic Sciatica." Dr. C. N. Hensel, St. Paul, began his medical clinic at 3:30 P. M.

The annual banquet was held at 6:30 P. M. in the Cataract Hotel on Wednesday evening, with Dr. C. L. Sherman, Luverne, Minnesota, president, in the chair. The address was "Medical Trends in a Changing Social Order," given by Dr. Adson.

On Thursday, January 20, at 9:00 A. M., Dr. R. L. J. Kennedy, associate in the pediatric department, Mayo Clinic, held a pediatric clinic. At 10:00 A. M. Dr. J. Arthur Myers, professor of preventive medicine in the University of Minnesota and president of the National Tuberculosis Association, spoke on "Controlling Tuberculosis in a Community." At 10:45 A. M. Dr. Clifford J. Barborka, Chicago, of the Northwestern

University Medical School, spoke on "Treatment by Diet in Disease."

At 11:30 A. M. Dr. J. J. Callahan, Chicago, lectured on "Fractures of the Neck of the Femur," accompanying it with motion pictures.

At 2:00 P. M. on January 20, Dr. J. Arthur Myers held a medical clinic; at 3:00 P. M. Dr. L. H. Sloan, associate professor of medicine in the University of Illinois College of Medicine, lectured on "The Correlation of the Clinical Picture of Acute Vascular Insults." At 3:45 P. M. on January 20 came the final lecture, "Bone Changes That Take Place in Various Diseases in Infants and Children," by Dr. R. L. J. Kennedy, Rochester, Minnesota.

New officers were elected as follows:

Dr. N. J. Nessa, Sioux Falls, president; Dr. H. I. Dorn, Sioux City, secretary; and Dr. Walter Brock, Sheldon, Iowa, treasurer.

About 160 physicians attended the meeting. The 1939 and 1940 meetings will be held at Sioux City, returning in 1941 to Sioux Falls, under a provision of the association's constitution.

News Items

Dr. James Clair Ash, Garden City, S. D., has moved to Lake Andes, where he will practice henceforward.

Dr. James J. Flynn, Missoula, has been reappointed physician for Missoula County in Montana.

A \$25,000 addition to Union Hospital in New Ulm, Minn., will be erected this year.

A \$1,200 urological X-ray table has been installed by St. Luke's Hospital in Aberdeen, S. D.

Dr. Werner Hemstead, who has been resident physician of the Minnesota State Reformatory at St. Cloud for the past 20 years, has retired. He is 77 years old.

Dr. David T. Schuele, a graduate of the University of Wisconsin Medical School at Madison, has located with the Gamble Clinic in Albert Lea, Minn.

Dr. John Samuel Tschetter, Huron, health officer of Beadle County in South Dakota for 9 years, was reappointed by the county commission on January 6, 1938.

Dr. William Lewis Wall, a graduate of the University of Minnesota Medical School in 1934, has located at Anoka, Minn., in the Witte Building.

The Municipal Hospital of Virginia, Minn., will build a \$150,000 addition to its plant this year, with a reported capacity of 125 beds.

Dr. James Eddy Arnold, of Miles City, Montana, a graduate of the Rush Medical College, University of Chicago, in 1917, has been appointed village health officer and school physician for Mountain Iron, Minn.

Dr. Dante Angelo Becchetti, 34, a native of Hibbing, Minn., died in Chicago on January 2, 1938. He was graduated from the Loyola University School of Medicine in Chicago in 1931.

One E. Torp was arrested in Butte on December 21, 1937, and charged with practicing medicine without a certificate from the Montana State Board of Medical Examiners.

Dr. Charles Albert Arneson, formerly of Fargo, has been named city health officer of the Bismarck City Commission in North Dakota. He has been with the Roan and Strauss Clinic in Bismarck.

Dr. Edwin Charles Ehmke, a graduate of the University of Minnesota Medical School, has accepted the position of resident physician in the Rotunda Hospital in Dublin, Ireland. He is a native of New Prague, Minn.

Word has been received of the death of Dr. Charles Ulysses Moore, 61, of Portland, Oregon. A graduate of the University of Minnesota Medical School in 1910, he practiced at Carthage, S. D., about 15 years ago.

The Minnesota Pathological Society met on January 18, 1938, at the Institute of Anatomy, University of Minnesota, to hear Dr. Thomas J. Dry, of Rochester, speak on "Congenital Heart Disease."

Work began on a new \$20,000 hospital at Watford City, N. D., during January. The building, erected by Works Progress Administration labor, will have a basement and first floor, and will be stucco-covered.

Dr. Elmer J. West, Duluth, Minn., has opened offices at 202 Paradise Theater Building in Faribault. He is a graduate of the University of Illinois College of Medicine.

The 15th annual convention of the Minnesota Hospital Association will be held at the Nicollet Hotel in Minneapolis from May 19 to 21, 1938. Eight allied organizations will convene with it.

Dr. Shubel M. Moulton, 72, died at Minneapolis on January 22, 1938. A graduate of the University of Louisville School of Medicine in 1892, he was one of the founders of the Minneapolis Athletic Club.

Dr. Philemon Roy, 69, St. Paul, died at McAllen, Texas, on January 21, 1938. A graduate of the old Drake University College of Medicine, Des Moines, Iowa, in 1896, Dr. Roy had practiced in St. Paul for 35 years.

Dr. Albert Edward Taplin, 72, of Veblen, S. D., died at his home on January 15, 1938. He came to Wilmot before 1900, and went to Sisseton, where he practiced until 1915. In that year he came to Veblen. He was licensed in 1904.

Dr. William P. Sadler, assistant in obstetrics and gynecology in the University of Minnesota Medical School, has been elected president of the staff of Northwestern Hospital, in Minneapolis. Dr. A. E. Benjamin, assistant professor of obstetrics and gynecology, is vice-president; and Dr. Donald Herbert Daniel is the secretary-treasurer.

Dr. Charles E. Shepard, associate professor of hygiene and physical education, and director of the Men's Student Health Service at Stanford University, Palo Alto, Calif., was elected president of the American Students' Health Association at Chicago on December 31, 1937. Dr. Ruth E. Boynton, associate professor of preventive medicine and public health, and director of the Students' Health Service, University of Minnesota, was re-elected secretary-treasurer.

Rochester, Minn., will be host to the Association of Military Surgeons of the United States next October 13, 14, and 15, 1938, according to the executive council of that body.

Dr. Julio Raymond Soltero, Lewistown, Mont., has been appointed health officer for Fergus County, and Dr. Curtis W. Wilder, Lewistown, is county physician. Both held their positions last year.

Dr. Arthur Gerrish Allan, 82, who had practiced medicine in Butte, Montana, for 35 years, died at Augusta in December 1937. He had gone to Augusta previous to his death.

The North Dakota State School for the Feeble-Minded at Grafton has Dr. Frank W. Deason, Grafton, as its medical superintendent, succeeding Dr. James Prentiss Aylen, of Grafton, whose term expired June 30, 1937.

Dr. Louis Edwin Jones, 39, a graduate of the University of Minnesota Medical School in 1924, died at Prescott, Wis., on December 28, 1937. Dr. Jones founded the Saint Croix Dale Hospital in Prescott shortly after his graduation from medical school.

Dr. DeWitt Clinton Jones, 69, a lifelong resident of St. Paul and former Ramsey County coroner, died at his home on December 23, 1937. He was graduated from the Trinity University Faculty of Medicine in Toronto, Ontario, in 1891.

Dr. Frederick J. Taussig, clinical professor of obstetrics and gynecology in the Washington University School of Medicine, St. Louis, spoke on "The Prevention of Abortion" before the Hennepin County Medical Society in Minneapolis on January 3, 1938.

Sister Mary Magdalene, O.S.B., founder of St. Joseph's Hospital in Deadwood, S. D., in the eighties, died at St. Martin's Convent at Sturgis on December 27, 1938. A pioneer Black Hills hospital worker, she founded the nurses' training school at St. Joseph's Hospital in 1906.

Dr. Arthur R. Sievers spoke on "Venereal Diseases" at the old Butte High School in Montana on January 13, 1938. This was the final lecture in the series sponsored jointly by the Silver Bow County Medical Society and the bureau of safety of the Anaconda Copper Mining Company.

Dr. Kee Wakefield, formerly of Hutchinson, Minn., but now of Minneapolis, celebrated his 95th birthday on December 28, 1938. He was graduated from the University of Wooster Department of Medicine in Cleveland in 1869, and practiced in Hutchinson for more than 50 years.

Dr. O. J. Hagen, Moorhead, a former regent of the University of Minnesota, and past president of the National Association of University Directors, now president of the Minnesota Public Health Association, celebrated his 31st year of practice in Moorhead on December 29, 1937.

Dr. Paul A. O'Leary, Rochester, professor of dermatology and syphilology in the University of Minnesota Graduate School of Medicine, was elected vice-president of the American Academy of Dermatology and Syphilology, which was organized in New York City on January 14, 1938.

Dr. Morris Wayne Bottorf, Kalispell, was elected president of the Flathead County Medical Society of Montana at a recent meeting. Dr. Albert A. Dodge, Kalispell, was elected vice-president; Dr. Eugene P. Cockrell, Kalispell, was named secretary; and Dr. J. Arthur Lamb, Kalispell, was elected treasurer.

Dr. Russell Welcome Tennant, 60, a native of Wayzata, Minn., who practiced for some years in Brookings, S. D., died at Long Beach, Calif., on January 1, 1938. A graduate of the University of Minnesota Medical School in 1899, Dr. Tennant left Brookings to practice in Spokane, Wash.

Dr. Charles Bradford Rodes, for nearly 30 years with the Murray Hospital in Butte, Montana, has been named president of the hospital's staff. He succeeds Dr. Peter Potter, who retired on October first. Dr. Lee Whitmore Smith became vice-president; and Mr. William H. Rex is the secretary-treasurer.

The November meeting of the Minnesota Pathological Society was held on November 16 in the Institute of Anatomy at the University of Minnesota, Minneapolis. Dr. T. R. Harrison, associate professor of medicine in the Vanderbilt University School of Medicine, Nashville, Tennessee, spoke on "Cardiac Dyspnea."

The North Dakota State Board of Medical Examiners has admitted 14 persons to the practice of medicine and surgery within the state. They are: Dr. Ethel Esther Little, Minot; Dr. Mary E. W. Soules, Grafton; Dr. Abraham Kolitsky, Granville; Dr. Melvin S. Jacobson, Elgin; Dr. Gunder Christianson and Dr. E. D. Perrin, Bismarck; Dr. Bernard A. Mazrowski and Dr. James R. Dillard, Fargo; Dr. Bernard M. Urenn, Minneapolis, Minn.; Dr. Frederick Ellis, New Rockford; Dr. William George Durnin, Bottineau; Dr. Donald Archibald McCannel, Minot; Dr. Sidney James Hoffman, Jamestown; and Dr. Virgil Owen Parrett, Wahpeton.

Dr. H. E. Hilleboe, chief of the division of services for crippled children of the Minnesota State Board of Control, addressed the joint session of the American Public Health Association and the National Society for the Prevention of Blindness in New York City during October.

Dr. Harry J. Fortin, Fargo, was chosen president of the Cass County Medical Society of North Dakota on December 27, 1937. Dr. Arthur C. Fortney, Fargo, was elected vice-president; Dr. Earl Maurice Watson, Fargo, was re-elected secretary-treasurer; and Dr. Murdock MacGregor, Fargo, was named counselor. Delegates to the state medical convention at Bismarck in May will be: Dr. Joel C. Swanson, Dr. George C. Foster, and Dr. Albert Milton Limburg, all of Fargo.

Dr. John Thomas Rogers, 70, widely-known St. Paul physician, died at his home on January 2, 1938. He was president of the board of directors of the Charles T. Miller Hospital in St. Paul, and a past president of the Minnesota State Medical Association. He was a graduate of the University of Minnesota Medical School.

Dr. Arthur Neumaier, a native of Germany and a graduate of the Duke University School of Medicine in 1935, will locate permanently at Lindstrom, Minn., in the offices of Dr. Clarence P. Truog. Dr. Truog will locate in Minneapolis. Since September 1937, Dr. Neumaier had been with the Raiter Hospital and Clinic in Cloquet.

There are a few vacancies at present for the Seventh Corps Area in the matter of physicians for duty with Civilian Conservation Corps. These appointments are contractual in nature, and may be consummated by either reserve or civilian physicians. Doctors interested should write to: Colonel Kent Nelson, Surgeon, Seventh Corps Area, Federal Building, Omaha, Nebraska.

Dr. Milburn Watts Kemp, chief of the Anoka State Hospital, has been appointed by the Minnesota State Board of Control to be superintendent of the new Moose Lake State Hospital for the Insane. Dr. Kemp will be succeeded at Anoka by Dr. Walter P. Gardner, assistant superintendent of the Fergus Falls State Hospital.

Dr. Hamilton Worth Emanuel, 80, of Milnor in Sargent County, North Dakota, who bears the number 464 in Dr. James Grassick's *North Dakota Medicine: Sketches & Abstracts* (1926) in the Roster of that volume, died at Milnor during January 1938. A graduate of the old Fort Wayne College of Medicine (Indiana) in 1880, Dr. Emanuel was licensed to practice in Dakota Territory on November 24, 1886.

Dr. Gordon R. Kamman, St. Paul, instructor in nervous and mental diseases in the University of Minnesota Medical School, and Dr. Hilbert Mark, epidemiologist for the Minnesota State Board of Health, Minneapolis, spoke before the Stearns-Benton County Medical Society on November 18 in St. Cloud, Minnesota.

Physicians of the executive council of the South Dakota State Medical Association conferred with Dr. R. C. Williams, of the United States Department of Agriculture, Washington, D. C., on November 4 at Huron, for the purpose of providing medical aid for clients of the Farmers' Security Administration in South Dakota.

The American Physicians' Art Association will meet conjointly with the American Medical Association at San Francisco, June 13 to 17, 1938. This will be the first exhibition of the association; entries can be made in oils, water colors, sculpture, photography, pastels, etchings, crayon, pen-and-ink drawings, wood carvings, and book bindings. Medical art work is not acceptable. The exhibition is not limited to first showings. Physicians in this territory should send their entries to Dr. F. H. Redewill, secretary, 521-536 Flood Building, San Francisco, before April 1, 1938.

Dr. Jennings C. Litzenberg, professor and chief of the department of obstetrics and gynecology of the University of Minnesota Medical School, Minneapolis, delivered the principal address, "Prenatal Care," at the White House Conference on Maternal and Newborn Care in Washington on January 17, 1938.

Dr. Martin Joseph Fardy, Minot, was elected president of the Northwest District Medical Society of North Dakota on December 30, 1937. Dr. Charles R. Kemphorne, Minot, is the society's new vice-president; and Dr. John Robert Pence, Minot, is the secretary-treasurer. The North Dakota State Board of Health furnished a motion picture film on "Neurosyphilis." Thirty physicians attended the meeting.

Dr. Earl R. Crow, Arlington, Minnesota, secretary of the Scott-Carver County Medical Society, writes that on November 9, the society met at Mudcura Sanatorium, Shakopee, with Mr. Paul Kabler, bacteriologist for the division of preventable diseases of the Minnesota State Board of Health, the speaker. He gave a demonstration on the Neufeld method of pneumonia typing.

Dr. Frederick Charles Lorenzen, of Elgin, North Dakota, a graduate of the old Wisconsin College of Physicians & Surgeons, Milwaukee, in 1909, has been named superintendent of the North Dakota State Hospital for the Insane at Jamestown, by the State Board of Administration. Dr. Lorenzen had practiced at Elgin for many years.

Funds collected in Albert Gallatin County, Montana, from the sale of tuberculosis seals, will be used to help pay for a new X-ray machine installed at Montana State College at Bozeman, according to reports. Free use of this machine will be allowed only to children in the county, and to those dependents who are cared for by the county.

Dr. Walter Stephan Broker, former chief of the Otter Tail County Sanatorium, has been named superintendent of Fair Oaks Lodge Sanatorium at Wadena, Minnesota, which is operated jointly by Todd and Wadena Counties. Dr. Russell Robert Hendrickson, former chief of the Fair Oaks Lodge Sanatorium, will enter private practice.

DR. COGSWELL'S 25-YEAR SERVICE RECOGNIZED

Tendered a Surprise Banquet

Helena, Montana:—Dr. W. F. Cogswell, secretary of the Montana State Board of Health for the past 25 years, was honored at a surprise Silver Anniversary banquet given for him on January 17, 1938, by the members of the State Board of Health and employees. Guests numbered more than 80 persons from all over the state, and included Dr. P. W. Covington of the Rockefeller Foundation, from Salt Lake City, Utah.

Members of the Board of Health who were present included Dr. L. H. Fligman, Helena, who acted as toastmaster; Dr. E. M. Porter, Great Falls, orthopedic surgeon, and Dr. B. L. Pampel, president of the Board

and past president of the Montana Medical Association, who presented Doctor Cogswell with a silver plaque from the Board of Health, employees and friends.

Talks commending Doctor Cogswell and his 25 years of outstanding service were given by the Hon. Roy E. Ayers, governor of Montana; Dr. Emil Starz, Helena pioneer druggist; Dean W. M. Cobleigh, Montana State College, Bozeman; Prof. R. A. Cooley, entomologist with the Rocky Mountain Spotted Fever Laboratory, Hamilton, who gave Doctor Cogswell much credit for the establishment of that laboratory; H. B. Foote, director of the Division of Water and Sewage, State Board of Health, who expressed the admiration of all the Board of Health employees for their Chief; Dr. P. W. Covington, who cited Doctor Cogswell's high standing with the Rockefeller Foundation; and Dr. W. P. Smith, president of the Montana Medical Association.

Among the fifty letters and messages received by Doctor Cogswell was one from Thomas Parran, United States Surgeon-General, who commended his fine work, and also congratulated the State of Montana "for its recognition of meritorious service as a guiding principle in the leadership of the State Department of Health throughout the past twenty-five years."

Another letter was from Joseph Brown, Browning, who as chairman extended the congratulations of the Blackfeet Tribal Council to their "Chief Little Bull," Doctor Cogswell's tribal name.

Typical of the many letters was the one from A. T. McCormack, M.D., secretary of the Kentucky Medical Association, who said, "Dr. Cogswell has maintained the high traditions of medicine in the conduct of his office and his determination to maintain for the medical profession that control of the Public Health movement which is essential to success, and his fine relationship with the profession, has made him outstanding among Public Health officials of the country."

The Third District Medical Society held its regular bi-monthly meeting at the Dudley Hotel in Brookings, S. D., Friday evening, January 21, 1938. About forty were in attendance including the guests, members of the auxiliary and members of the society. Dinner was served at 6:30 P. M. following which a business meeting was held and then the guest speaker, Dr. Edward B. Tuohy of the Mayo Clinic, Rochester, Minn., gave a fine lecture on Anaesthesia.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

DOCKET OF CASES

Minneapolis Woman Sentenced to 5 to 20 Years
at Hard Labor

Re: STATE OF MINNESOTA vs. MYRTLE L. BRANDENBURG

Myrtle L. Brandenburg, who holds no license to practice any form of healing in the state of Minnesota, entered a plea of guilty on January 6, 1938, in the District Court of Hennepin County to an indictment charging her with manslaughter in the first degree. The defendant was sentenced by the Honorable

Levi M. Hall, judge of the District Court, to a term of 5 to 20 years at hard labor in the Women's Reformatory at Shakopee.

Mrs. Brandenburg, who stated she was 37 years of age, and the mother of three children, performed a criminal abortion on a 27-year-old married woman who died from the effects of the abortion on November 23, 1937. The defendant resided at 664 Fourth Avenue Northeast, Minneapolis, and had been under suspicion for some time of being in this type of criminal work. She admitted that she had performed other abortions, stating that she received \$25.00 each for a few of them; but that most of the time she received from \$5.00 to \$10.00 per abortion. She also was practicing medicine unlawfully by furnishing pills and other medicines to the patients. She used a chromium-plated catheter and elm bark as her chief weapons, and these were found by Minneapolis policewomen, hidden in the radio in the Brandenburg home.

Mrs. Brandenburg had no medical training of any kind and this case again illustrates the terrific penalty paid by lay people, who go to quacks, who have no knowledge of anatomy and the absolute necessity of sterile conditions. The prompt and effective disposition of the case is due, in great part, to the splendid work done by the women's bureau of the Minneapolis Police Department and the cooperation shown by the coroner's office under Dr. Gilbert Seashore, and the county attorney's office. The imposition of this sentence by Judge Hall should be a warning to a number of individuals in Minneapolis that the law does catch up to them, and that the penalty can be made quite severe.

Classified Advertisements

PHYSICIAN WANTED

Physician wanted in good town of 500 population in southwest Minnesota. Large territory to draw from. Good office space available; reasonable. Write Box No. 11, care of this office.

LOCATION FOR SALE

Eye-ear-nose-and-throat and good refraction business for sale, for cost of part of equipment. Located in southeastern part of South Dakota. Write Box No. 12, care of this office.

NURSE—TECHNICIAN WANTED

To assist in surgery and to do laboratory work in a twenty bed private hospital in South Dakota. Write, giving full details, to Box 340, care of this office.

NURSE WANTED

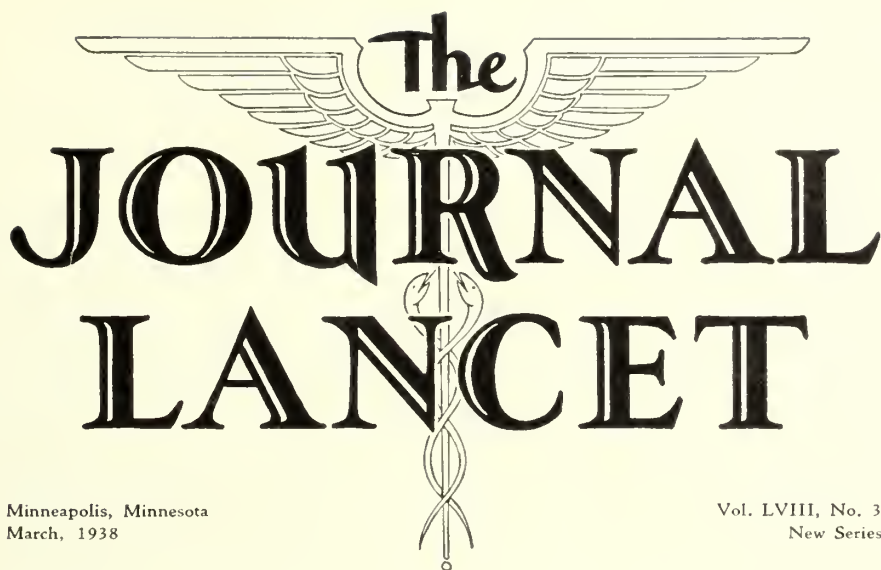
Graduate nurse with postgraduate operating room experience. Minneapolis hospital. Address Box 342, care of this office.

FOR SALE

For Sale—One Cameron Diagnostic Light Set, Two Hemoglobinometer (Sahle), Platform Beam Scale with Measuring Rod, Castle Sterilizer, Hydraulic Treatment Chair, Alpine Lamp, Examination Table, Standard X-ray and Fluoroscope, One Fischer Diathermy, and Surgical Instruments. These articles may be seen at St. Francis Hospital, Breckenridge, Minn.

TWIN CITIES—FOR RENT

Doctor's office occupied by prominent physicians, elegantly equipped. Large and pleasing reception room, well lighted examination room, separate treatment rooms, laboratory, free gas, free compressed air, hot and cold water. New up-to-date physician and medical building located in best residential business district. Unusual opportunity. Address Box 350, care of this office.



The JOURNAL LANCET

Minneapolis, Minnesota
March, 1938

Vol. LVIII, No. 3
New Series

A Message from Thomas Parran, Jr., M. D.

It is bold, perhaps even unwise, to comment upon the success of the present campaign to stamp out syphilis—a campaign that has only started and that necessarily must continue for many years. It is the last chapter, not the first, that is the criterion of success. However, I cannot forbear mentioning gratification at the enthusiasm already aroused. The slogan “STAMP OUT SYPHILIS” has become a national chant. Physicians are behind it; health officers are behind it; and almost without exception the public is behind it.

The response may indicate that we have been too timid about facing the facts before. Sixty-two years ago Dr. Marion Sims, retiring president of the A. M. A., pointed the way. Briefly, he proposed that syphilis be put on the same public health basis as cholera or smallpox or yellow fever. He had faith in the good sense of the people. Tell them the truth, he said, they will cooperate with us. For sixty-two years we have ignored that advice. Today we are learning that Marion Sims was right.

From a medical viewpoint the tragic late complications of syphilis are anachronistic. They do not belong to the twentieth century. It is our business as physicians and health officers to find syphilis in time to treat it satisfactorily. The physician must uncover it through better diagnostic methods and greater use of the serologic test. The health officer must help him by providing accessible laboratory facilities and drugs for treatment. Since it is an epidemic disease, both must take greater pains in reporting and following-up cases.

To my mind, the important thing about the papers presented in this issue of THE JOURNAL-LANCET is the underlying note of determination with which they have been written. In black and white are set down steps that have been achieved, steps that will be achieved. They point to a planned, coordinated program of attack. Under such an attack syphilis must give way.

THOMAS PARRAN, M.D.
Surgeon General, U. S. Public Health Service
Washington, D. C.

The Syphilis Control Program

In the North Central States

C. C. Applewhite, M.D.[†]

Chicago, Illinois

THE RECENT development of a nation-wide educational campaign for the control of syphilis has thrown a grave responsibility upon public health administrators and the medical profession. The public health administrators are charged by law with the responsibility of providing reasonably adequate facilities for the control of this disease on a sane and sensible basis. Funds and trained personnel adequate for satisfactorily performing this task have not been and are not at the present time available. The responsibility likewise falls upon the medical profession, since the essential preventive measure is a successful treatment of all new cases of this disease. In the control of no other communicable disease is it more urgently necessary for there to be at all times a spirit of teamwork between the public health officials and the practitioners of medicine. Neither agency working alone can satisfactorily solve this problem. Recent studies reveal the fact that only a small percentage of those suffering from syphilis are financially able to obtain treatment essential for a cure. The medical profession cannot be expected to render this type of service to a large percentage of the cases without just compensation. To provide treatment facilities adequate for the solution of this problem will require much larger sums of money than are at present available.

With the funds available under Section VI of the Social Security Act, all of the states in District No. 3, which embraces the states of Illinois, Indiana, Iowa, Michigan, Minnesota, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin, have markedly strengthened the previously existing program or created a new program for the control of this disease. It now is generally believed that it is the function of the State Health Departments to assume leadership in the program and to provide the following facilities on a state-wide basis.

First—Provide to all of the physicians free diagnostic service for all stages of the disease.

Second—Provide free of cost to all physicians drugs essential to make the cases no longer transmissible.

Third—To supply the follow-up service for those cases who failed to continue treatment and to locate the sources of infection.

Fourth—To provide for those physicians who are actively engaged in treating this disease reasonably adequate consultation service.

As is to be expected, the program for the control of syphilis varies with the respective states. There is no uniform program for the control of this disease which is applicable in all of its details to every state. There is also a wide variation in the methods of approach

utilized by the respective states. In most of the states in this district the approach has been rather commendable in that the respective state health officers have realized full well that the program must of necessity extend over a period of years rather than months. In discussing the syphilis control program of the North Central states it is impossible, due to lack of space, to do more than give a brief outline of the program in the respective states.

With respect to supplying free diagnostic service to the physician, all of the states with the exception of Indiana and Michigan supply this service. These states supply free diagnostic service for indigents. The following states supply to the physicians free arsenicals and a preparation of bismuth for all cases of syphilis regardless of the financial status: Ohio, Michigan, Illinois, Iowa, Nebraska, North and South Dakota. Indiana, Minnesota, and Wisconsin supply the drugs to those not able to pay.

The control of syphilis is regarded by all of the state health officers in this district as a function of the division of preventable diseases. The syphilis control officer in all of the states with the exception of Indiana, is a physician. The following states have selected as the head of the syphilis control program a physician who has had one year's special training in an eastern school: Iowa, Michigan, Ohio, South Dakota, and Wisconsin. The program in Minnesota is under the direct supervision of that pioneer in venereal disease control work, Dr. H. G. Irvine.

With this preliminary general statement, there is given a brief outline of the syphilis control program in the states comprising District No. 3.

Illinois

More than 30 per cent of the total allotment to the state of Illinois under Section VI of the Social Security Act has been budgeted specifically for the purpose of augmenting and making more effective the campaign against venereal diseases in the state of Illinois and the city of Chicago. An additional 12 per cent of the total allotment has been budgeted for improving the laboratory facilities in the state. A large portion of this sum is being utilized for the diagnosis of venereal diseases. The state of Illinois provides free laboratory diagnostic service to all physicians within the state, and supplies free arsenicals and an appropriate heavy metal for the successful treatment of all cases of syphilis reported to the state by the physicians. The program also calls for state subsidy to venereal disease control clinics established at strategic points within the state. The program is under general supervision of the chief of the division of communicable diseases and is under the immediate supervision of a full-time venereal disease control officer.

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Five assistant epidemiologists for field duty are also provided. The duties of these epidemiologists are to contact the medical profession in their respective districts, acquaint them with the general policies of the state health department with respect to venereal disease control, assist with the general educational program, endeavor to locate sources of infection and to secure an examination of all contacts and see to it that all cases remain under treatment until released by the physician, and to render consultation service to the general practitioners of medicine. Liberal provision has been made for visual education of the medical profession and the general public by the use of recently developed motion picture films, exhibits and literature. Provision has also been made for the establishment of branch laboratories at strategic points within the state in order to assist the physicians in making a prompt and early diagnosis. The need for branch laboratories was made extremely urgent by the recent passage of a law within the state requiring pre-nuptial examinations for gonorrhea and syphilis for both parties prior to the issuance of a license to marry. This law has markedly increased the work of the laboratories.

Indiana

Indiana is the only state in District No. 3 whose program for the control of venereal diseases is not under the immediate supervision of a physician. The present program has been in operation for quite a number of years. The state board of health maintains a hygienic laboratory at Indianapolis for the diagnosis of venereal diseases on patients who are indigent. It is understood, however, that a rather liberal interpretation is made of the word *indigent*. The state health department has recently perfected an arrangement with the private laboratories whereby a flocculation test for the detection of syphilis will be made for \$1.00. For individuals unable to bear this expense, physicians may use the state laboratory. In this way laboratory service is made available to all the people. This state also supplies for indigent patients regardless of the stage of disease the necessary arsenicals and heavy metals for the successful treatment of syphilis. At present the state is coöperating with city and county health departments in the operation of fourteen venereal disease clinics which are located in the most populous centers of the state. Personnel from the bureau of venereal diseases make investigations with respect to sources of infection, family contacts, and coöperate with all city and local health officers in this very important phase of the control program. Unfortunately, the state has not made provision for adequate consultation service for the physicians practicing within the state.

A general public health educational campaign is executed throughout the state. Recently, plans have been formulated whereby it is expected that a rather extensive postgraduate course in the modern treatment of venereal diseases may be given to the physicians in that state.

Iowa

During the past year Iowa has launched a rather comprehensive program for the control of venereal diseases. On July 1st, 1937, the physicians of the state of Iowa

for the first time in the history of the state were able to obtain free laboratory diagnostic services from the state. On that date, as a result of the action of the recent legislature, free laboratory services were made available. The appropriation from the state legislature for laboratory service was augmented with social security funds. The general report form has been revised so as to include a report of the case by initials of the patient and date of birth, and antisypilitic drugs are made available without cost to the physicians upon receipt of the report of a case. The venereal disease control program is under general supervision of the director of the division of communicable diseases and is under the immediate supervision of a full-time physician who has had a one year's postgraduate training in venereal disease control work in an Eastern university. Provision is also made for the necessary follow-up work to determine the sources of infection and to induce the delinquent cases to return for treatment. A considerable amount of this follow-up work is being done by public health nurses. An advisory nurse in the state health department is charged with the responsibility for this phase of the work. There are maintained within the state sixteen treatment-centers or clinics, most of them being in the larger cities of the state. An effort is being made to improve the facilities and the technique employed in these treatment centers. A rather extensive educational program is being put into execution both for the physicians and the general public.

Michigan

On September 1, 1937, a physician was appointed as full-time venereal disease control officer in the Michigan State Health Department. This state recently has passed a pre-nuptial physical examination law. In anticipation of the increased serological service incident to the operation of this law, \$25,000.00 has been allotted to the public health laboratory. Twenty-five thousand dollars have been budgeted for the administration of this program and the purchase and distribution of arsenicals and bismuth to the physicians in the state. The rules and regulations for the control of venereal diseases have been revised. The new report will contain the name, initials, or physician's serial number, color, sex, date of birth, and address of the patient, the name and stage or form of the disease, and the method of diagnosis. Reporting by name and address will be required only for those patients who lapse treatment and for patients with syphilis "in contacting occupations" unless the treating physician will be responsible for obedience to an order to discontinue such occupation until two injections of a suitable arsenical drug have been administered. It is planned also to place restriction upon nurses, nursemaids, and domestics with gonorrhea, who are in contact with children. In those areas having full-time local health service, the reports are to be made to the local health departments. In the other areas the reports are made directly to the state health department. The drugs will be distributed to the physicians by the full-time health departments in the areas having such an organization, and by the state health department in the unor-

ganized areas. Prior to 1932, the state health department rendered free diagnostic service to all of the physicians within the state. In 1932 this service was limited to indigents. Since that date there has been a marked reduction in the number of cases of syphilis reported to the state health department. This fact emphasizes the imperative necessity of the state's providing free laboratory diagnostic facilities if a successful campaign is to be executed for the control of syphilis. The venereal disease control program in Michigan is just being inaugurated. However, it is felt that since this state has such a well-organized local health service that excellent results may reasonably be expected within the next few years.

Minnesota

The state health department of Minnesota has waged a continuous and unrelenting campaign against venereal disease since 1918, being the second state in the Union to inaugurate such a program. This state has clearly demonstrated that definite results can be achieved in reducing the incidence of these diseases by the execution of a sane and sensible program continuously over a period of years. In the thirteen-year period (1923-1936) there has been a reduction in the number of cases of syphilis reported, of approximately 30 per cent, and during the same time the number of cases of gonorrhea reported has decreased approximately 45 per cent. As evidence that these reductions are in all probability real and not due to faulty reporting, attention is called to the fact that during the period 1925 to 1936, the number of specimens sent to the state laboratory for the diagnosis of these diseases has increased more than 100 per cent and teachers at the medical school have complained of the paucity of clinical material which could be used to demonstrate the various stages of syphilis to the students. Those in administrative authority are of the opinion that the reductions are probably real and that the measures which have been utilized in the past have been effective. The present program in Minnesota, therefore, is a continuation of the old program with greater emphasis being placed upon the consultation service with an extension of the epidemiological work. The laboratory service has been strengthened and the medical social service program has been augmented. The present program has been succinctly summarized in a recent state public health publication as follows:

- "1. Stimulation of case-reporting and reporting suspected sources and contacts as required by regulation.
2. Free laboratory service as aid in diagnosis and in following progress of treatment.
3. Epidemiological field investigation of all infectious cases to discover and bring under treatment by physicians where indicated, all sources and contacts.
4. Follow-up of patients with syphilis and gonorrhea who are reported by physicians as having lapsed treatment.
5. Free drugs to physicians for treatment of patients unable to pay.

6. Arrange with local authorities to pay physicians for treatment of patients unable to pay.
7. Education of lay public regarding syphilis and gonorrhea.
8. Coöperation with the medical department of the University of Minnesota, the State Medical Association and official or lay agencies interested in venereal disease control."

Nebraska

Fifteen per cent of the total allotment from Title VI of the Social Security Act to the state of Nebraska has been budgeted with an equal amount of state funds for the purpose of inaugurating an effective campaign against venereal diseases. In addition, the state laboratory has been augmented in order to render a more efficient diagnostic service to the physicians of the state. The program is under the immediate supervision of a full-time venereal disease control officer. The physicians of the state are supplied with free laboratory service and the necessary arsenicals and heavy metals for the treatment of all reported cases, if requested by a physician. An active and intensive educational program both for the medical profession and the general public has been successfully inaugurated. Particular stress is being placed upon the epidemiologic phase of the work. Provision has been made in the program for a well-trained medical social service worker to render assistance in locating the sources of infection and contacts with known cases with a view of securing an examination and competent treatment when indicated. Due attention will also be given to those cases who fail to continue treatment until cured or are no longer a potential menace to society. It is estimated that approximately 60 per cent of the cases of syphilis in this state are being treated by private physicians. Clinics where patients may obtain free treatment are maintained by the city of Lincoln, the two medical schools in Omaha, and by the city of Omaha.

North Dakota

In North Dakota the program for the control of venereal disease is made an integral part of the division of preventable diseases. The director of that division is to be in immediate charge of the program. Due to shortage in well-trained personnel for this work, the director of local health service is temporarily directing the activities of this division, which has been established since the enactment of the Social Security Act. The state laboratory has been markedly improved during the past year. The state health department at present provides free to the physicians of the state, laboratory diagnostic service and arsenicals and an appropriate heavy metal for the treatment of all reported cases of syphilis regardless of financial status. Provision also has been made for refresher courses in the modern methods of treating syphilis to be given the physicians of the state by a syphilologist with experience in teaching. The whole program is at present in the developmental stage and thus far little has been done in providing for the essen-

tial epidemiologic service. It has been possible for the director of local health service to render a small amount of this type of service and some consultation service. Although the program may be regarded as in its incipency, it is felt that real progress has been made in that the physicians have been provided with free drugs and free laboratory service. The attitude of the special committee appointed by the state medical association is worthy of special commendation and augurs well for the ultimate success of the program when it really gets under way.

Ohio

In Ohio the venereal disease control program is considered an integral part of the division of preventable disease. However, it is under the immediate supervision of a full-time control officer who has had considerable public health experience and one year's special training in an Eastern university. Provision has been made for materially strengthening the laboratory service. The state at present provides free to the physicians of the state, laboratory diagnostic service and drugs for the treatment of all reported cases of syphilis. In an effort to find a solution to the syphilis problem in the rural areas, provision has been made for the payment to physicians for the treatment of indigent cases where no clinics are available. This phase of the program is limited strictly to the rural areas.

Quite an extensive educational program is being put into execution both for the physicians and the general public. There has been established at Western Reserve University a training center for teaching state, city, and local venereal disease control officers and physicians employed in venereal disease clinics, the modern methods used in a successful control program. This course is available to all such personnel employed in the area covered by District No. 3. Persons desiring to take advantage of this course of training must be recommended by their respective state health officer.

An effort is also being made to improve and make more efficient the clinic service now available in the larger centers of population. The division at present is able to render a moderate amount of consultation service to the physicians in the state. It is planned to use nurses who have had special training in venereal disease control methods to do the necessary follow-up work for determining sources of infection and inducing lapsed cases to return to treatment. Already eleven nurses have been given this special training at Western Reserve University.

South Dakota

The program in South Dakota is being executed by the division of communicable diseases which is under the immediate supervision of a physician who has had one year's special training in an Eastern public health school. At present, considerable emphasis is being placed upon methods of perfecting a more accurate system of reporting in order that the problem in this state may be more clearly defined. A rather comprehensive

educational campaign both for the physicians and the general public is being waged. The state has provided free for the physicians of the state, laboratory diagnostic facilities and drugs necessary for the treatment of all stages of syphilis, except neurological cases, in return for a complete report of the case. In the six recently organized county health departments, provision has been made for the necessary follow-up work incident to locating sources of infection and inducing lapsed cases to return to the physicians for treatment. The control officer is equipped to render a moderate amount of epidemiologic assistance and consultation service to the physicians upon request. This program has been started just recently. However, it is felt that it is basically sound and should accomplish worth-while results.

Wisconsin

The program for the control of venereal disease in Wisconsin was inaugurated in 1919 and has continued without interruption since that date. This state, like Minnesota, offers a striking example of what can be accomplished by the execution of a sane and sensible venereal disease program over a period of years. During the period 1922 to 1935, the incidence of cases of venereal diseases in the communicable stage reported to the state health department has been reduced as follows: Gonorrhea 30 per cent, syphilis 40 per cent, and chancroid more than 90 per cent. From the very beginning of the program, education of the public has been persistently and particularly stressed. Wisconsin is somewhat unique in its educational program in that provision has been made for the employment as social hygiene lecturers for the youth of the state, individuals who had previously had teaching experience. The state health officer attributes much of the success of the program to the work of these lecturers. Just recently the whole venereal disease program in Wisconsin has been placed under the immediate supervision of a full-time control officer who has had one year of postgraduate training in an Eastern university. The essential features of the Wisconsin program are as follows:

1. Free laboratory services for the diagnosis of syphilis and gonorrhea by the Madison laboratories for all physicians of the state. The eight branch laboratories of the state make free examination for gonorrhea upon specimens submitted.
2. Free drugs to physicians and institutions for indigent and near indigent cases of syphilis.
3. The stated board of health finances or partly finances twelve coöperative venereal disease clinics at various points in the state.
4. The state board of health employs seven social workers at various points in the state for the necessary follow-up work.
5. The nine deputy health officers are required to do the necessary follow-up work in their respective districts.
6. Venereal diseases are reported directly to the state board of health. Syphilis is reportable only in communicable form. Communicable syph-

ilis is defined as those cases with open lesions, early cases having less than 20 doses of some preparation of arsenic and 20 doses of an appropriate heavy metal, and pregnant women with syphilis.

7. Compulsory institutionalization of refractory cases.
8. Marriage law requires a Wassermann test on both contracting parties prior to marriage.
9. Social hygiene lecturers to 416 of the 436 high schools of the state and other groups—one man and two women.
10. Venereal disease control officer and lecturer with the latest developed films.

From this brief and sketchy outline of the programs in the respective states, it can be seen that a real start has been made by those in administrative charge in endeavoring to bring these plagues under control. Progress in organization and perfecting plans has been impeded by the paucity of well-trained personnel who could assume a place of leadership in the program. In many instances it has been necessary to give these key men the training essential for the successful prosecution of the program. Suffice it to say that a real start has been made. From this worth-while beginning it is sincerely hoped that the public health agencies and the medical profession in the respective states may so coördinate their efforts that an effective plan for the satisfactory solution of this great public health problem may be perfected and put into successful operation.

The Control of Syphilis in North Dakota

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AT THE PRESENT TIME there is no medical or public health subject which is of greater public interest than syphilis control. Practically all known methods of health education have been utilized on a wholesale basis to consummate a nation-wide publicity campaign. Father, mother, sister and brother have all been exposed to lectures, moving pictures, magazine and newspaper articles and radio talks until the temperature of the public mind has almost reached the high fever range. The foreign body that still obscures the vision in the public eye is the fact that with all the estimates and surveys that have been made, there is still no accurate information available with which they can be informed of the actual incidence and prevalence of syphilis in their community.

History

1. The first constructive step in venereal disease control in North Dakota occurred on March 29, 1918, when the United States Public Health Service published standardized board of health regulations which had been approved by the surgeon generals of the Army, Navy and Public Health Service for the control of venereal disease. These regulations were adopted by the North Dakota State Board of Health and became effective at once.

After the passage of the Kahn-Chamberlain Act by Congress in June 1918, the bureau of venereal disease was established in the North Dakota Department of Health and an officer of the Public Health Service (Dr. F. R. Smyth) was appointed as full-time director. The act provided for allotments of funds to the states for venereal disease control, under certain conditions, and North Dakota received \$6,274.24 as its share for the first year. Free clinics for the treatment of venereal disease were

established in Grand Forks, Fargo and Minot and were maintained by funds contributed jointly by the Public Health Service, State Department of Health, and the city. Arsphenamine and mercury were furnished free of charge with state and federal funds and a concentrated educational campaign was begun. As a result of this program, a total of 1294 cases of venereal disease were reported to the bureau of venereal disease during the first full fiscal year of its establishment (July 1, 1919, to June 30, 1920). Later, because of lack of funds, the free clinics were discontinued.

The Syphilis Control Problem in North Dakota

1. General Considerations.

Because of its large area, relatively sparse population, climatic conditions, and the poor economic conditions resulting from the prolonged drouth, the syphilis problem, as well as other public health problems, is peculiar to the state. The estimated population is 700,000 and approximately 85 per cent live on farms or in small villages. The total area of the state is approximately 70,000 square miles, so there is an average of only 10 people to the square mile. Thirty-four per cent of the total population¹ is receiving help from one of the various relief agencies. There are 477 licensed physicians, 233 or 48 per cent of whom are concentrated in the ten largest cities. In three entire counties, there are no licensed physicians.

2. Prevalence of Syphilis.

During the five-year period, 1931-1935, there was an average of 333 new cases of syphilis reported to the State Health Department each year. Using the United States Public Health Service statistics² as a basis, the State Department of Health has estimated the expected incidence of syphilis in the state as 2 per 1,000 population.

† Health Officer, State of North Dakota.

This figure has been adopted arbitrarily, as no accurate knowledge of the actual incidence and prevalence of syphilis in North Dakota is available. Many of the physicians of the state believe this figure too high even though it is less than one-fourth of the estimated rate for the United States as a whole (8.4 per 1,000 population—Moore³). If this estimate is correct, 1,400 new cases of syphilis can be expected each year. It is believed that the reasons for the discrepancy between the actual cases reported and the estimated number are:

- a. Physicians do not report all their cases.
- b. Many syphilitics are treated by quacks and in drug-stores.
- c. A large number of infected individuals do not realize they have the disease. This group includes those whose symptoms have been overlooked or misinterpreted and those with latent syphilis.³

3. Reporting.

It is an accepted fact that no program for control of any communicable disease can be effectively carried out without accurate knowledge of the frequency of occurrence of the disease. In other words, accurate reporting is needed so that the problem can be evaluated, and the amount of time and funds to be expended can be estimated. It is also generally accepted that venereal disease reporting is more incomplete than reporting for other communicable diseases.

"When the medical world is faced with the control of a contagious disease, the success of its combative efforts will depend largely upon its ability to determine the number of individuals affected, the sex and race of these individuals, whether the disease is widespread or localized, and other important epidemiological characteristics." ²

Since the time when venereal diseases were first made reportable by law in North Dakota, the name and address of the infected person has been required. North Dakota physicians have not objected to this requirement and just recently the venereal disease committee of the North Dakota State Medical Association has recommended that the present method of reporting be continued. There were 422* cases of syphilis reported during 1937 as compared to 206 for 1936. It is believed that this increase is due to the furnishing of free drugs, more intensive follow-up contacts and sources of infection, and the national and state educational program.

4. Epidemiologic and follow-up work.

Source and contact investigations are done by the venereal disease control officer from the central office of the State Health Department in Bismarck except where there are full-time health officers as in the city of Fargo and in the southeast health district comprising the counties of Barnes, Stutsman, LaMoure, Dickey, Sargent, and Ransom. This important work is seriously handicapped at present by insufficient trained and experienced personnel to do the necessary field work. However, in most cases, physical examinations are secured for sources

of infection and delinquent cases are returned for treatment by means of letters from the central office. In only a small percentage of the cases are the sources named in the physicians' reports. It is a well-known fact that syphilis usually spreads in small epidemics and unless the source of infection of early cases can be found and examined, control measures will be of little value. The fact is that syphilis, like tuberculosis, is a family disease, and is generally accepted as such by the medical profession; yet very few physicians examine the family contacts of their luetic patients. Education of the physician in the epidemiology of syphilis is a prerequisite to further progress in the control of the disease.

5. Case-Finding.

It was noted previously that only about one-fourth of the estimated number of cases of syphilis are actually reported and a large number of infected persons do not realize they have the disease. Much of this deficit could be made up, if modern case-finding methods were more widely used. These methods include:

A. Routine Wassermann or other sero-diagnostic test on: ⁴

1. Every hospital admission.
2. Every complete physical examination.
3. Every case of doubtful diagnosis.
4. First prenatal examination of every pregnant woman.
5. Every life insurance examination.
6. Every examination for marriage.

B. Dark-field examination of every suspicious initial lesion.

C. Epidemiologic investigation and examination of source of infection and contacts of each infected person.

6. Treatment facilities.

The public syphilis clinic *per se* does not seem practical in North Dakota. Even the largest cities of the state are comparatively small, and any person seen attending such a clinic soon become the victim of public gossip. There are only four cities in the state with a population of 10,000 or over; and even the largest city (Fargo) has a population which approximates only 30,000 people. As stated previously, three clinics were established in the state in 1919, but were later discontinued because the small attendance did not justify the expenditures necessary. The private physician is the backbone of the syphilis control program and in his hands lies its eventual success or failure in North Dakota.

Although the State Department of Health furnishes free drugs, there are still a great many infected persons who do not receive treatment. In this group are chiefly those borderline cases who are not on the relief rolls, but who still cannot pay the physician for his services. Even the relief clients, in some counties of the state, do not receive treatment because the local welfare boards lack the necessary funds.

In this connection, Parran⁴ states, "At least one-half of the syphilitic patients of the country cannot afford to pay for treatment even at the minimum prevailing rates

* Tentative.

in private practice. This is especially true if the patient must bear the cost of blood and spinal fluid tests and other special examinations. The same yardstick used in determining eligibility for public relief—food and shelter—is not adequate to measure the inability of a syphilitic patient to pay for treatment. . . . I do not advocate the treatment of all patients with syphilis at public expense. This should not be necessary or desirable. It will not be if practicing physicians will look for syphilis and know how to diagnose and treat it, both as a disease and as a communicable infection. Additional public and voluntary funds, however, are needed to remove the economic barrier to care for those unable to pay for such services."

In North Dakota at the present time, it is believed that approximately 70 per cent of syphilitic patients would be unable to pay for necessary treatment at the rates prevailing in private practice.

In this state, as well as in other parts of the country, a great many physicians are not prepared to treat syphilis. Although the treatment of early syphilis has been mechanized to such a degree that it has become merely a technician's job, the diagnostic and treatment difficulties encountered in latent and late syphilis and especially cardiovascular and neurosyphilis will often tax the knowledge, skill and judgment of the most experienced specialist.

The treatment of syphilis is of paramount importance to public health officials because as Parran⁴ and others have said, "from the standpoint of spread, treatment is prevention." To encourage the use of modern treatment methods in syphilis, the State Department of Health, in coöperation with the United States Public Health Service, will participate financially in the organization of "refresher courses" to be sponsored by the district medical societies throughout the state. These courses will be conducted by a syphilologist of known teaching ability.

7. *The North Dakota Marriage Law.*

The present marriage law prohibits the marriage of persons infected with a "contagious venereal disease," but requires an affidavit showing freedom from venereal disease from the male partner only. The law does not specifically require laboratory confirmation of this evidence. The law should be amended so as to require medical examination of both partners to the marriage, and laboratory confirmation of freedom from venereal disease should be a prerequisite to the issuance of a license.

8. *Recommendations of the Venereal Disease Committee of the North Dakota State Medical Association.*

Because of the need for close coöperation between the medical profession and the public health authorities, Dr. E. L. Goss, president of the State Medical Association, appointed a committee of nine members, Doctors Frank Darrow, Fargo (chairman); Paul Rowe, Minot; L. W. Larson, Bismarck; Harry Benwell, Grand Forks; D. J. Halliday, Kenmare; John Crawford, New Rockford; C. J. Meredith, Valley City; M. M. Heffron, Dickinson;

and Glen Toomey, Devils Lake, to act as the venereal disease committee of the State Medical Association and as an advisory committee on venereal disease control to the State Health Department.

These representatives of the medical profession were invited by the state health officer to meet in Bismarck on September 24, 1937, to participate in the negotiation of principles and the formulation of plans and policies for the control of venereal disease in the state. At the meeting of the committee on this date, the following recommendations were made:

1. That the State Department of Health supply each district medical society with information regarding the number of reported cases and the expected prevalence (applying rate of 2 per 1,000 population) for the area included in the district.

2. That the present method of reporting venereal disease to the State Health Department be continued.

3. That in cases in which physicians request the State Health Department for consultation service in venereal disease, the department act as a clearing house to refer requests to an appropriate consultant.

4. That the function of the public health nurse in the venereal disease program should be to collaborate with the physician at his request. No investigation should be made by the nurse except on request of the physician.

5. That a member of the committee and a representative of the State Health Department meet with the State Welfare Board to effect plans whereby physicians can be given authorization to treat relief clients infected with venereal disease without revealing the name of the patient to the local welfare board.

6. That a publicity campaign should be instigated among physicians to secure sources of infection to venereal disease cases.

7. That in each district medical society, one meeting should be devoted to the venereal disease program of the State Department of Health. At this meeting the setup of venereal disease reporting, control methods, and the publicity program should be discussed.

8. That formal recommendations be made to the State Welfare Board that indigents be treated on the family physician-patient basis. In the opinion of the committee, venereal disease clinics such as the one in Grand Forks should be discouraged.

9. That the fee for treating indigent cases of syphilis should be \$2.75 for intravenous treatment, and \$1.50 for intramuscular treatment when material is furnished by the state. When material is not furnished by the state, the fee should be the same as at present, \$3.34 for intravenous, and \$1.67 for intramuscular.

10. Routine Wassermanns should be taken

- a. On all hospital admissions.
- b. On all complete physical examinations.
- c. On insurance examinations if possible.
- d. On first prenatal examination.
- e. In all state institutions, possibly including colleges and the University.

That repeated treatment should be given during each pregnancy of a syphilitic mother, and treatment should begin before the fifth month of pregnancy.

That the Wassermann examination should be included in examinations of indigents for the prevailing fee of \$3.34.

11. That the State Health Department make available, where practical, the darkfield examination to physicians of the state, and that capillary tubes be supplied for submitting specimens. These examinations should be made on all suspicious syphilitic lesions.

12. That the recommendations of the Coöperative Clinical Group be adopted as the standard treatment for early syphilis.

13. That refresher courses in the diagnosis, treatment and control of the venereal diseases be offered in each district medical society. The State Department of Health has agreed to participate financially in this program.

14. Physicians of the state should coöperate with the public health authorities in the health education campaign. Whenever possible, physicians should give the talks to lay organizations on the subject of venereal diseases.

9. Venereal Disease Control Program.

The following control program is conceived as a long term project and some of the objectives cannot be attained for some time.

A. Central Administration.

I. Division of Preventable Diseases.

1. Venereal Disease Control Officer.

a. Duties

- (1) Administrative.
- (2) Advisory—Consultation with local physicians on diagnosis, clinical management plus epidemiology of syphilis, *etc.*
- (3) Coöperative—With medical profession and other state health departments, and with the Division of Child Hygiene and Division of Laboratories.

B. Reporting. As mentioned previously, venereal disease reports in North Dakota, as elsewhere, are inadequate. It is believed that better reporting can be accomplished in the following ways:

1. Better coöperation with the medical profession.

- a. Furnishing free arsenicals.
- b. Free consultation service both for diagnosis and treatment.
- c. Personal contact with local physicians.
- d. Improved laboratory facilities for Wassermanns and darkfield examinations.
- e. Talks at medical society meetings.
- f. Follow-up work on each physician's delinquent cases.

2. Education of lay population on the dangers and complications of the disease and advantages of early treatment.

3. Passage of legislation making drug-store and "quack" treatment of syphilis a felony.

C. Case Finding.

1. Routine Wassermann on hospital admissions, complete examinations, insurance examinations, marriage examinations, and prenatal examinations.

2. Epidemiological investigation of families and contacts of infected persons.

Moore³ estimates that these methods would triple the number of cases found. He states that these cases make up 44 per cent of all admissions to his clinic.

D. Control of Infectiousness.

1. Early diagnosis.

a. Education and encouragement of use of darkfield examination.

2. Adequate treatment.

a. Minimum standards of coöperative clinical group.⁶

3. Public health education.

a. For civilian population—Nelson.⁷

- (1) Formal sex education in the school, church and colleges.
- (2) Talks at teachers' colleges, high schools, *etc.*
- (3) Posters in public places.
- (4) Talks to women's club, civic clubs, *etc.*
- (5) Radio, press releases, moving pictures.

b. For physicians—Stokes.⁸

- (1) More complete training in medical school.
- (2) "Refresher" courses.
- (3) Pamphlets and circulars on control and management.
- (4) Consultation service and field teaching.
- (5) Medical society talks.

4. Control in small cities.

a. Whenever possible the patient should be treated by his personal physician.

5. Control of Congenital Syphilis.

a. Education and encouragement of physicians to take routine Wassermanns on first visit of all prenatal cases.

b. Wassermann on all hospital obstetric cases.

c. Early and continuous treatment throughout each pregnancy.

6. Follow-up and contact work.

a. Syphilis control officer.

(1) Letters from central office.

(2) Field investigations where required.

- b. District health officers.
- c. Public health nurses.
- d. Quarantine of the vicious and those refusing treatment.
- e. Law enforcement authorities.¹⁰

E. Community Program.

1. Continuous venereal disease publicity campaign.
2. Provision for adequate sex education.
 - a. In homes.
 - b. In schools.
 - c. In churches.
3. Provision for regular and adequate recreational activities.

10. Morbidity of Syphilis in North Dakota.

Tables are shown giving the number of cases of syphilis reported by physicians to the State Department of Health from 1922 to July 1st, 1937; and Wassermann surveys on Indian reservations in the state. No conclusions as to the actual incidence and prevalence of syphilis in these groups can be drawn from the statistics in the Wassermann surveys. However, one can gain a general impression of the amount of syphilitic infection that has occurred.

TABLE I
Syphilis
(1922-July 1, 1937)

Year	Male	Female	Total	Year	Male	Female	Total
1922-24			507	1931	246	167	413
1925	145	85	230	1932	252	188	440
1926	160	78	238	1933	162	128	290
1927	117	72	189	1934	210	93	303
1928	199	117	316	1935	148	74	222
1929	321	195	516	1936	119	87	206
1930	234	175	409	1937*	87	73	160

* July 1st.
TOTALS

2,400 1,532 4,439

TABLE II
Fort Totten Indian Reservation
69 Cases of Syphilis in an Indian population of approximately 1,000.

TABLE III
Turtle Mountain Indian Reservation
March 17, 1937

March 17, 1937					5,000
1.	Population of Reservation				63
2.	Number of cases of syphilis among adults				60
3.	Number of cases definitely known to be acquired				
4.	Number of Indians having Wassermanns listed below:				
Year	No. of Indians Having Wass.	Positive New	Positive Old Repeats	Congenital	
1931	426	8	33		
1932	419	3	12		
1933	533	9	31		
1934	638	13	19		
1935	532	9	22	2	
1936	530	4	12	1	
1937	166	1	5	1	

TABLE IV
Fort Berthold Indian Reservation
Total number of Wassermanns 343
Total number of positives 37
Percentage of positives 10.8%

11. Coöperation of the Private Physician in the Control of Syphilis.

As has been noted in the control program, the coöperation of the private physician is of the utmost importance. This is clearly expressed in the following quotation from Wile⁹:

"The whole-hearted coöperation of the private physician in the program of national control of a communica-

ble disease is not only an imperative necessity, but carries with it an obligation of public and private responsibility. In assuming the care of a case of communicable disease, the physician assumes a dual responsibility. He is obligated to the patient in the first place, to carry through with him until such time as he ceases to be a public health problem. His second responsibility, a more public one, is, by strict adherence to existing regulations, to carry out such measures as are prescribed by health authorities so that during the patient's infective period he is of little or no risk to those with whom he comes in contact. The problem of venereal disease control, from the standpoint of protection of those in contact with the affected individual, is a more difficult problem in many ways than that of such communicable diseases as demand isolation and quarantine. In the care and control of venereal diseases during the infective period, the responsibility of the physician rests not only with such remedial measures as are at hand to render the patient noninfective in the shortest possible time, but, because of the peculiar and intimate methods of possible transmission, to impress upon the patient a sense of personal responsibility which is the best safeguard against his exposing others to his infection.

From the standpoint of vital statistics, and for the immediate purposes of the study of venereal disease incidence, it is of paramount importance to recognize that earnest and sincere coöperation on the part of the practicing physician is required to fulfill the obligation of reporting, which is of first importance in the control of any communicable disease.

The obligation of the private physician in his coöperation in venereal disease control, is, therefore, a clean-cut one. This obligation, however, is by no means one-sided. On the part of the public health officials, an obligation also exists. This should be to place at the hands of physicians at all times, such resources, information, and assistance as may be available through public funds. At all times the effort should be made to conserve, as far as possible, the time-honored relationship of patient and physician.

By united effort, therefore, and by cordial coöperation between the public health agencies on the one hand and the private physician on the other, the objective of control seems well within reach, notwithstanding the ethical and personal considerations which thus far have handicapped a united public approach to the problem."

12. Conclusions.

1. Statistical material showing the actual prevalence of syphilis in North Dakota is lacking. There is an imperative need for surveys showing the prevalence and distribution of the venereal diseases in the state.

2. The private physician should make a determined effort to locate and examine the source of infection and contacts of each case of syphilis that he treats.

3. Further public funds should be made available for the treatment of indigent and borderline cases of syphilis. Each infected person must be given treatment, regardless of his ability to pay.

4. The current publicity campaign has stimulated public interest in syphilis control. In the final analysis the responsibility for success or failure in the eradication of syphilis in North Dakota, remains with the medical profession.

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Syphilis Control in South Dakota

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THAT the control of syphilis is distinctly a public health measure has been adequately established by the broad educational policy of the United States Public Health Service.

With the advent of a wide-spread campaign against syphilis came an increasing demand upon public health facilities. People wished to know what syphilis might be. Why the sudden emergence of a tainted word? Is there a great deal of syphilis? Does one person out of every ten I meet have syphilis? If the disease exists in such great numbers, how may we control it locally? Such is the situation in South Dakota. In that respect, it is unreasonable to assume that we face a different problem than our neighboring states. These problems must be of mutual interest.

Upon the basis of these and a number of similar questions, the program in this state was founded. Of prime interest was the question, "How much syphilis do we have?" Although national incidence is fairly well-established, sufficiently at least for a wide-spread campaign, it became apparent that we were in dire need of an accurate estimate of the number of cases existing in a given area. Object number one of local control became the institution of methods to better establish the incidence of the disease.

Reporting of venereal disease has, for a number of years, been carried on in accordance with those reports submitted for other communicable diseases, *i. e.*, a card bearing pertinent data on the case, his household relations, age, occupation and possible source of infection. The South Dakota law provides, however, that in cases of venereal disease, initials or numbers or both may be used. These cards were then submitted to the local health officer and after recording were forwarded to the State Department.

The use of numbers, although a valuable asset when cards were being mailed as such and open to careful scrutiny by a host of intermediaries in its delivery to its final destination, has been very confusing. Duplications were noted and checked in certain instances, but it must

be inferred that a number of cases remained as duplicates in the final tabulation. Conversely, a number of cases no doubt were not able to classify as new cases due to errors in the assignment of numbers at the point of origin.

South Dakota, with its 77,615 square miles and a population density of 8.9 per square mile, offers only a few areas of population concentration where surveys might be easily conducted. Sioux Falls and Minnehaha County, with its efficient health department, have been carrying on a considerable amount of work in examination of food handlers. These results should prove highly valuable when they are ready for publication, for Sioux Falls is the most heavily populated area within the state. The great rural areas of South Dakota do not lend themselves to this means of examination, and incidence in general must be gathered by reports sent us by scattered physicians. Therefore, with the state as a whole as a reporting area, we may consider the reported cases for a five-year period.

SYPHILIS REPORTED IN SOUTH DAKOTA

Year	1932	1933	1934	1935	1936
Cases	273	309	106	84	97
Incidence per 100,000	39.4	30.2	15.3	12.4	14.3
Death Rate per 100,000	1.55	2.83	3.08	2.86	3.4

This, upon its face, would indicate a downward trend over the five-year period, but contacts in the field made by various members of the State Health Department gave them every reason to suspect that the method of reporting was failing in a number of ways. Inquiry indicated a definite reticence in reporting this disease especially among private patients of good financial standing. It was noted that a number of cards appeared with complicated code numbers inserted in the line provided for the name, while others appeared with complete data and the name lettered in with meticulous care. It was obvious that the indigent cases were being reported

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in the most complete manner, while other patients, if reported at all, were carefully guarded from prying eyes. These practices, though not particularly damaging to the ultimate aim of bringing all cases under treatment, tend to impede accurate recording.

With all the varying factors in mind, a survey was instituted in South Dakota to the end that information could be compiled showing just how many cases were existing in South Dakota at a given time. This work was started by Doctor F. R. Zeiss in late November, 1936, and the reports were completed in January, 1937. Doctor Zeiss assumed other duties soon after this, and the results were not analyzed until a later date.

The survey, upon completion, showed that 75 per cent of all the physicians in South Dakota responded. They were asked to enumerate the number of cases of syphilis known to them at the time of the survey. In addition, they were asked to differentiate between those under treatment and those who, for various reasons, were not receiving treatment, although presumably still infectious. These physicians reported 609 cases, of which 217 were not receiving treatment. Basing this on the 1935 census, this alone would indicate an incidence of 90 cases per 100,000 persons, or about 1 per 1,000. Thirty-five per cent of known cases were not receiving treatment.

If we were then to assume that 25 per cent of the physicians were to add a proportionate 25 per cent to the total reported cases, the incidence would become slightly more than 1 per 1,000. This assumption is subject to far too many variables to be interpreted within narrow limits.

This tabulation produced a reported incidence greatly below those recorded in other parts of the country. Still another method of approach to our reporting problem needed to be made. After reasoning that probably most of the syphilitics in the state, if under treatment, were receiving medication through the State Department, it was decided to include that factor in our plans. A complete but brief case report was required with each requisition for anti-syphilitic drugs. These were classified as new and old cases in accordance with the amount of treatment received. New cases obviously had no treatment record. This report, after being checked with the date of onset, was filed and duplications thereafter thrown out. Every case for which arsenicals were being issued has been filed, but as before stated, duplications were carefully checked so none might appear. From the period beginning June 1, 1937, to January 1, 1938, there were 259 cases reported as receiving treatment. Our most recent figure, then, indicates an incidence of 38.4 cases per 100,000 for the half-year ending December 31, 1937. For the reason that this figure included cases under treatment, regardless of previous reporting, it would be unwise to assume that this number would increase proportionately in the ensuing six months.

Additional work has been carried on through contacts with physicians throughout the state. These contacts tend to stress the relation of the physician and the public health offices. Educational films have been shown to the

physicians in different places in the state, the theme of which emphasizes the importance of treatment. Treatment in turn then produces a report in the Health Department, which produces results to the mutual benefit of all concerned.

After the introduction of the social security program, lay education has been stressed. Lectures are given accompanied by movies on the nature and prevention of syphilis. This film produced by the United States Public Health Service has been received satisfactorily and has produced the desired reaction.

There has been a marked tendency among local officials who make arrangements for the showing of the film or lectures on syphilis to carefully segregate the sexes, in spite of repeated suggestions that such should not be done. The question has been attacked more openly and far more lasting educational results have been noticed in those places where combined groups have attended the discussion.

In meeting the laity, we are able to contact many people. The policy adopted here has been strictly that of inducing the people to consult their own physicians. Only in a few instances has treatment been given in our health units, and then only at the request of the physician in charge. We have, in our lectures, told the public what to expect from the physicians, adhering closely to the recommendations of the most recently reported effective means of treatment.

The anti-syphilitic drugs supplied through the department to everyone, regardless of his financial status, are purchased in accordance with the recommendations published by the United States Public Health Service. Those furnished are standard brands of neo-arsphenamine, bismuth subsalicylate in peanut oil, a compound of bismuth and arsenic for intramuscular use and a trivalent arsenical. The bismuth and arsenic compound is furnished to facilitate treatment in children where venipuncture is difficult.

The Department of Health has sponsored no clinics up to the present. There are a few areas in the state with sufficient population to justify clinics, but for the major portion, the idea has appeared unsound economically and functionally.

Follow-up service is furnished insofar as is possible through our health units, the public health nurses, and the central office. Specialized social service work along this line would be highly valuable but would require more money than could well be appropriated. The unit price of visits due mainly to our "great distances" would be far beyond the unit value. It is only fair, however, to state that those "great distances," in themselves, tend to curb the pandemic nature of syphilis.

The state laboratory is prepared to furnish Wassermann examinations on all blood samples sent in from points within the state. The Kahn reaction is run as a matter of routine check. These tests are performed without charge to the patient or the physician submitting them.

The Health Department is watching with interest our latest method of reporting. Obviously, it is too early to make any bold statement of incidence. We do, however, feel that our number of infectious cases of syphilis in South Dakota at any given time is probably less than 1 per 1,000 persons. It has been observed that people are interested in the disease and the subject is being freely discussed. There remain a few isolated cases of tottering prudery. These will be unable to stand the test of time.

The physicians within the state have developed a keen interest in treating syphilis and on the whole those patients coming to their attention are receiving adequate care.

Follow-up services are notably weak, but growing public sentiment may, in the long run, produce the much needed funds with which to supply these services. There will be a time when the organization within the state is able to bring every infectious case of syphilis under the care of his physician. That day, however, is not just around the corner.

Clinical Aspects of the Control of Syphilis

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THE CLINICAL aspects of the control of syphilis have received little attention thus far in the campaign against the disease, as most of the effort has been directed toward discussions of treatment and more recently toward serologic studies. Discussions of treatment have been especially directed toward early syphilis, as this phase of the disease lends itself to systematization of the therapeutic program. In addition, public health officials have intensified the campaign against this infectious phase in order to prevent the further spread of syphilis, and because the incidence of cures is higher when the recommended amounts of treatment are given during this acute phase of the disease.

The schemes of treatment now recommended for the treatment of early syphilis are based on studies of large series of cases observed for many years. These studies have demonstrated the superiority of the continuous system of treatment. Studies on latent syphilis have emphasized the fact that this phase of the disease does not need a standardized system of treatment, but rather requires a certain amount of individualization. The treatment of late syphilis, however, demands individualization of the therapeutic program.

In the consideration of any scheme of treatment, the status of the patient's defense mechanism is the vital factor that determines the eventual outcome of the disease. It is known that certain patients are cured without treatment, others need a small amount of treatment, whereas for some, treatment must be intensive and drastic to produce satisfactory clinical and serologic results and, for still others, no amount of treatment is able to prevent the rapid spread of the disease. Too little attention has been paid to the part the patient's defense mechanism plays in the outcome of his disease because of enthusiasm in the past for the so-called specific remedies.

The development of newer flocculation and precipitation tests for syphilis and coöperative serologic studies

have led to a major advance in syphilology. The newer flocculation tests have increased the diagnostic acuity of the serologist by at least 15 per cent. Because of the increased sensitivity of such tests, the number of patients who maintain for many years a positive blood test (so-called Wassermann-fast) has been considerably increased. As tests are further developed and as they become more sensitive, however, care must be exercised not to produce a technic that will give numerous, false positive reports.

The United States Public Health Service is coöperating with various state laboratories in standardizing serologic technics, an effort which will increase the dependency the medical profession places on these laboratories. The financing of new clinics, furnishing antisyphilitic drugs to the indigent, and the making available to physicians of the community a consultation service to aid in the treatment of their patients, are among some of the efforts to make the treatment of syphilis more efficient. In addition, the creating of marriage laws to deal with patients who have syphilis, and the publication of articles in the newspapers and magazines, have stimulated the interest of the laity in syphilis, which is essential to an efficient campaign against the disease.

While the campaign has been reaching this point, but little attention has been paid to the clinical aspects of syphilis. This does not mean that this phase of the problem has been ignored or purposely overlooked, but rather that the protean nature of the disease has made it difficult to discuss its clinical features in short papers such as this. The manifold nature of syphilis, with its involvement of the special senses, central and cardiovascular systems, viscera, and bones, as well as the skin, requires that the physician who desires to be an expert in the diagnosis of syphilis must in reality be a specialist in all fields of medicine. As the manifestations of syphilis frequently appear in these structures in atypical form, a diagnosis based on the clinical findings alone is becoming decidedly rare. A resort to serologic and therapeutic tests has been easier than endeavoring to unravel such clinical problems. On the other hand, the

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fact that syphilis involves the nervous system early in the course of the disease, and the fact that aortitis with valvular involvement, which is a common cause of death, is not suspected early enough by the majority of physicians treating patients with syphilis, are aspects of the clinical problem that may well be emphasized.

To outline the symptomatology and course of the disease in its various aspects would be a herculean task and, if done, would have but little interest for the reader; however, it does seem that familiarity with a few of the cardinal earmarks of the disease would sufficiently increase the physician's threshold of suspicion so that the possibility of syphilis as a cause of an individual's disability might be more frequently suspected because the effort to publicize the disease, furnish free drugs, and free serologic tests will be futile if syphilis is not included more frequently in differential diagnoses. The average physician only occasionally encounters a patient with syphilis in his practice, and the frequency with which he encounters syphilis at present is dependent not so much on his clinical threshold of suspicion for the disease as on the frequency with which he takes blood for serologic tests. A recent survey in Chicago showed that the majority of the patients receiving treatment for syphilis were under the care of the practitioners, and were not in the dispensaries as has frequently been suggested. Nevertheless, the manner in which syphilis simulates other diseases, and its ability to masquerade as some other infection, make it unwise to attempt to make a syphilologist of every physician.

I will now briefly enumerate some clinical criteria which, if borne in mind by physicians who care for the majority of patients with syphilis, will materially raise the level of their threshold of suspicion for the disease: 1. Disregard the patient's economic or social standing; do not omit taking a blood test because he is wearing a clerical collar or is the local bank president. 2. Fewer patients now object to the taking of blood for a serologic test; in fact, many are now asking for it. 3. Although syphilis is acquired in the majority of cases between the ages of seventeen and twenty-eight, the appearance of a genital lesion at any age should arouse the suspicion of a chancre. 4. All patients who acquire syphilis do not manifest chancres and many of them have mild and asymptomatic secondary lesions; do not attach too much significance, therefore, to the absence of a history of syphilis in the presence of a positive serologic test. 5. In the presence of a genital lesion, do not begin treating the patient for syphilis until the diagnosis is confirmed by the laboratory. A few days' delay in starting treatment in cases of early syphilis is less dangerous than treating a patient who does not have syphilis. Confirm your suspicion by a dark-field examination, a positive blood test, or by the appearance of the "secondaries"; there is no such thing as a positive therapeutic test for suspected chancre. 6. The secondary eruptions of syphilis are often bizarre, so confirm the diagnosis before starting treatment. Drug eruptions may simulate the cutaneous manifestation of acute syphilis.

7. Latent or dormant syphilis may be permanent or temporary, and, if permanent, is equivalent to cure. If the disease was recognized as latent syphilis before the signs of late syphilis developed, the stage of latency was then temporary. Accordingly, when a patient encountered for the first time is in the phase of latency, consider the disease to be of the temporary type until treatment, time, and frequent observations have convinced you that it is permanent. 8. Remember that a positive Wassermann in latent syphilis of ten years' duration or more may mean one of two things: either that the patient has some active visceral form of the disease, or that he is in the permanent phase of latency, in which case a positive Wassermann has only slight significance. Treatment, examination of the spinal fluid, time, and frequent observations are the means of determining to which group he belongs. 9. Neurosyphilis is a manifestation of acute syphilis. The spinal fluid of every patient under treatment for acute syphilis must be tested before treatment is discontinued. In many of the "Wassermann-fast" cases a persistently-positive serologic reaction is due to a positive spinal fluid. Do not endeavor to explain neurologic accidents, to patients whom you have been treating, as due to some other cause; suspect neurosyphilis first and then disprove its presence by examining the spinal fluid before looking for other causes for such accidents. 10. The best results in the treatment of neurosyphilis are obtained in cases in which patients are treated early in the course of the disease; accordingly, when patients are under treatment, mild ataxia, suggestive changes in the pupils, irritability, change in personality, and unexplained headaches, should be the indication for intensifying or changing the program if the spinal fluid is also not showing favorable response. 11. Syphilitic cardiovascular involvement is insidious in its onset; hence, a cardiovascular examination and roentgenograms of the chest to discover the status of the aorta should be a part of the examination of each syphilitic. Especially is this true if the Wassermann test remains positive. The roentgenogram of the chest and a history of precordial distress is often of more aid in the diagnosis of aortitis than the stethoscope. 12. Accept Wassermann-fastness as an indication of neurosyphilis, or of cardiovascular or visceral syphilis, until time, laboratory aids, and observation have proved them not to be present. 13. The diagnosis of syphilis of the liver or of the stomach is made by exclusion, at operation, or by a therapeutic test. The last offers presumptive evidence only. Syphilitic involvement of the liver requires the avoidance of arsphenamine, and the results from mercury and iodides are superior to bismuth. Plan on a slow, protracted therapeutic course, using small doses of the milder remedies for patients with suspected visceral syphilis. 14. The serious complications of syphilis appear as a rule by the fifteenth year of the disease; each year thereafter that these fail to appear, the more likely is the patient to avoid them. 15. The facility and adequacy of the serologic laboratories today warrant their use in cases in which patients have bizarre lesions of the mucous membranes, especially if such lesions are

persistent. 16. The patient with an active defense mechanism may require but little treatment. When immunologic processes are inert, intensive treatment with both the specific and nonspecific therapeutic agents may be necessary. In neurosyphilis, especially, is it well to resort to nonspecific measures as soon as a fair trial with the specific remedies fails to produce clinical and serologic improvement in the blood and spinal fluid. 17. The practice of giving treatment every year to a patient who has had a mild form of the disease is condemned; it is better to spend more effort on determining the status of his disease than in endeavoring to keep any complications smothered by constant treatment. The frequent use over long periods of arsenicals and heavy metals often leads to the development of serious sequelae in the liver or kidneys. 18. Syphilis is infec-

tious during the first five years if untreated; patients with latent or late syphilis are not in an infectious state in the ordinary sense and accordingly are not subject to quarantine. Likewise, the question as to when a syphilitic may marry can be answered only when the actual status of his disease is determined.

These criteria, which are only a few in the clinical control of syphilis, are directed toward increasing the threshold of suspicion of the physician who treats syphilis only occasionally. Adequate treatment of early syphilis will prevent many of its late complications, and in those cases in which the patient did not receive treatment during the acute phase, early recognition of the numerous complications and proper treatment will usually at least keep the disease under control.

Syphilis Control:

The Need for Efficiently-Performed Serodiagnostic Tests

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Introduction

THE GENERAL picture of the serologic diagnosis of syphilis has changed markedly in the past quarter of a century. From the old Wassermann test there have been developed hundreds of modifications. In addition to the original complement fixation reaction we now have the flocculation or precipitation tests well-developed in this country by Kahn, Kline and their followers. Microscopic tests have been devised which permit serologic examination when only a small amount of blood is available. Both the ability of the test to give no false positive reactions, excepting only in yaws, leprosy, relapsing fever and acute malaria (specifically), and the ability to recognize the presence of syphilis (sensitivity), have been enormously increased. At the present time the good serologic tests, either complement fixation or flocculation, should be negative in well over 99 per cent of all non-syphilitic individuals, excepting only those affected with the diseases mentioned a few lines above. As regards the ability of the tests to recognize syphilis, the figures are not so high. In syphilis during the very early chancre stage, the test has not had time to become positive, "the sero-negative primary stage", and in the late stages of the disease may have "burned out", or treatment may have modified the reactions to such an extent that a negative reaction results. At this place it were well to point out that tests may be "set" at varying degrees of delicacy or sensitivity. Extremely delicate tests will very frequently be positive in late cases, and will often be positive fairly soon after a chancre appears, say ten or twelve days.

The trouble with a too-sensitive test is that it is apt to give "false positives" in a few persons who are not infected with syphilis.

Taken by and large, it has been found that some 70 per cent of the patients who present themselves with a chancre, 99.9 per cent of those with florid secondary syphilis, and 80 per cent of those with late syphilis (after the second year of infection), should show positive reactions in a properly conducted laboratory.

There is no doubt but that good serologists are steadily improving their tests so that their reliability is greatly increased. The modern serologist must study and test these modifications if he expects to keep up with the rising standard.

The work of the Committee for the Evaluation of Serology has shown which tests are the most reliable,¹ and also the reliability of the tests in 39 state laboratories.²

The Value of Serologic Procedures

That dependence upon serologic reports is not the only way to diagnose syphilis is recognized by all syphilologists and most other well-trained physicians, but there is an unfortunate tendency in many quarters to regard serologic investigation as the one high priest to whom all should bow down. When any one method is made a master it is high time for plain speaking—or more. Other methods of diagnosis that still have great value are: The dark-field in chancre, general physical examination in all stages of syphilis, except chancre, spinal fluid examination in neurosyphilis, the X-ray in aortitis and its complications and in bone syphilis, and a possible host of general medical or surgical diagnostic

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methods in some obscure cases of the late types of the disease. In rare instances a correct diagnosis has been made by histologic examination. The examination of the placenta in competent hands is another valuable method. And a taker of good histories will be led to suspect many instances of the disease that his confrères have overlooked.

Taken all in all, serologic examination, in competent hands, is a very sure means of diagnosing untreated secondary cases, and a reasonably sure method of diagnosing some 80 per cent of untreated late cases. There is no other single method that is so sure, swift, easy and inexpensive for either the health officer or private physician. Routine serologic examination is of the greatest value in unearthing syphilitic patients that have not been suspected, either by their physicians or by themselves. In some states prospective brides and grooms must be "certified"; must have a serologic examination before marriage. A clean bill of health from a state laboratory that recognizes only one-half of the syphilitic sera sent it is of very little value. Again it is well to point out that in many so-called "Wassermann-fast" cases where over one hundred injections of arsphenamine have been administered, it is doubtful if any court would uphold the law against marriage.

Examination of the spinal fluid will reveal, in over 95 per cent of all instances, the presence or absence of neurosyphilis. In many instances the recognition of involvement of nervous syphilis at any early date will lead to the adoption of a type of treatment that will result in a permanent cure, and thus avoid the chances of crippling.

It is not only in diagnosis but also as a guide to treatment that a serologic examination is of value. Of course, nearly all of us realize that treatment should *not* be stopped as soon as a serologic reaction becomes negative, either in early or late syphilis. But in asymptomatic cases the reversal from positive to negative is universally accepted as a good sign.

Value of Serology to the Health Officer

If any attempt is to be made to control syphilis, it is essential not only to recognize the infectious cases, but to know the incidence of the disease, and in what persons it occurs. No health officer can arrange his budget without knowing how many persons must be treated. The most practicable way, at present, for the health officer to secure information as to the frequency and distribution of syphilis is by means of serologic examinations. In addition, from the public health standpoint, they are often supposed to give a certain amount of evidence as to the syphilitic individual's capacity to transmit the disease. Naturally a person with a chancre, still Wassermann-negative, is an active menace, and undoubtedly syphilis may be transmitted by many a patient with a negative blood. It cannot necessarily be assured that a syphilitic with negative serology, be the disease early or late, is not a grave potential risk.

Fallibilities of Serologic Tests

The frailties of serologic tests must be considered under four heads: first, the defects incidental to the tests themselves; second, defects due to personnel; third, defects due to local laboratory arrangements; and fourth, defects due to the faulty collection or shipment of specimens. Any one of the four may be fatal to good work.

(1) *Defects inherent to the tests.*

The first study of the Evaluation Committee¹ showed very clearly that certain tests were much better than others. For instance, in this study there were 13 participating expert serologists, only 5 of whom demonstrated an ability to report no false positive reactions, and 4 of whom dropped below 99 per cent. The sensitivity of the tests varied to a considerable degree, the ability of the workers to detect syphilis varied from 65.8 per cent to 88.2 per cent.

A study of the tests used upon the spinal fluid³ has revealed that certain of the flocculation tests are not suitable, although some are just as efficient as are the complement fixation tests. It is important to note that tests upon patients who have been treated with malaria, or with more than 12 injections of trypanamide, or 15 injections of arsphenamine, show marked discrepancies in the reports of individual observers. Tests upon the spinal fluid from untreated cases of cerebrospinal syphilis show somewhat better, but not uniform results, for the ability of some tests to detect syphilis (sensitivity) is unsatisfactory.

Only 8 of the 13 tests were satisfactory as regards their ability to exclude syphilis (specificity). Likewise, in leprosy⁴ and malaria⁵ there was marked variation in results. The studies at the Copenhagen and Montevideo conferences likewise showed considerable differences in the values of the tests.

(2) *Defects due to personnel.*

It is believed by all experienced serologists that many of the unsatisfactory reports emanating from serologic laboratories are due to personnel. I can recall sending four comparable specimens of blood from the same patient to the same laboratory on the same day and receiving four different reports ranging from completely negative to completely positive. Upon investigation it developed that the technician was drunk at the time the tests were done. It is no unusual experience to find that the blood taken from a patient will be completely positive one week and completely negative the next week. Such discrepancies may be due to ill-trained or careless technicians, or they may be due to errors on the part of the individual who sends out the report cards. Serological tests require that all components entering the test be absolutely standardized. It is very easy for an operator to omit one of these standardizations and hence risk spoiling the results.

Every one experienced in the serology of syphilis fully realizes that many difficulties arise not only in the performance of the tests, but also in the interpretation of

the results. For instance, certain sera, fortunately very few in number, will give positive results with complement fixation methods, but negative with flocculation tests.

To be a successful operator, one must possess a certain amount of scientific background, must have good training, must be conscientious, and must have good habits; hence any technician possessing the above qualifications for serological tests deserves a good salary.

(3) *Defects due to local laboratory conditions.*

A serologist who is called upon to do all other types of laboratory work will frequently find it difficult to devote the necessary amount of time to his serological work. It is a wise rule that when one is engaged in serological work he should not be interrupted with requests for blood counts, urinalysis, or blood chemistry examinations. This necessarily means there must be sufficient help in the laboratory. The technician should hardly be expected to perform meticulous cleaning of glass-ware, but he should have direct supervision of it. Likewise there should be a clerk to record the findings and send out the reports. A technician's time should be too valuable to devote to such details.

(4) *Defects due to collecting of blood.*

Many laboratories blame the unsatisfactory reports which are sent out upon the manner in which the blood is collected. It is true that the blood must be collected in amounts sufficient so that the tests can be performed upon it; likewise it must be collected in a dry syringe or tube. It is also essential that all apparatus be sterile, and that the tube in which it is to be shipped be tightly and carefully corked. Preferably it should be shipped so that the specimens will not lie around the laboratory for several days. Blood samples should not be put into the icebox until coagulation has occurred. It is barely possible that the ingestion of a large amount of alcohol shortly before the withdrawal of blood will interfere with the test. If these precautions are all followed the laboratory statement that the collection of blood was faulty is an alibi pure and simple.

(5) *Defects due to unknown causes, or various causes.*

In the literature there are hundreds of reports comparing the results obtained in various laboratories with various tests. Most of these are not worth the paper upon which they are written, for the laboratory work has not been evaluated against a laboratory known to have high standards. The third study of the Evaluation Committee² evaluated 39 state laboratories, all of which received comparable samples of blood. The control serologists were: Hinton, Kahn, Kline and Kolmer, whose results were all 100 per cent specificity (freedom from false positives) and from 83.9 per cent to 92.9 per cent sensitivity (ability to detect syphilis). In this series of tests the standard chosen for satisfactory work upon the part of the state laboratories were as follows: specificity 99.1 per cent, and sensitivity not less than 10 per cent below that of the control laboratory for that test. In addition, it was decided that if a laboratory

gave a rating of 70 per cent in its ability to detect syphilis its work might be classed as "fair". Lower figures for specificity or sensitivity were considered unsatisfactory.

A brief discussion of these criteria seems desirable. None of the four control laboratories, Hinton, Kahn, Kline and Kolmer, gave a single false positive reaction, yet 17 out of 71 of the above tests performed by the states had a rating of 99 per cent or less. The feeling is gaining ground that with a carefully-chosen group of donors the satisfactory specificity rating should be 100 per cent.

As regards ability to detect syphilis (sensitivity), the results were worse. The sensitivity of the Kolmer test was 88.2 per cent. To have a satisfactory test the state laboratory should have shown 78.2 per cent or better. Out of 71 performances with various tests by the 39 states only 30 showed a satisfactory rating, and a number of these gave false positives.

According to the above standard, only 13 out of 39 states had all of their tests satisfactory or fair, and only 6 could be classified as really satisfactory. Some of the state reports were unbelievably bad. One state reported only 92.0 per cent on specificity and 34.8 per cent on sensitivity. Another reported 90.9 per cent specificity. All told five different states performed at least one test which failed to detect at least one-half of the total cases of syphilis. At the present time it is impossible to say what is the cause of these shocking results, but they do exist, and obviously need correction. We know not whether adherence to old and faulty methods, faulty personnel, or bad laboratory conditions are responsible, but the fact remains, whatever the reason, that the results are not what they should be.

Results of Defects

A false diagnosis of syphilis, based upon the serologic findings is, in the words of Moore, "a major calamity." The inability of his laboratory tests to detect more than 40 per cent of syphilis may well prove a serious handicap to the conscientious health officer. In addition, failure to detect contagious cases is no help to the control-of-syphilis movement.

Special emphasis should be placed upon the necessity for accurate serological work in order to detect the presence of syphilis in prospective mothers. A state laboratory that fails to detect at least one-half of the cases makes a most unwelcome gift of a crop of congenital syphilitics to the people of the state.

The criticisms directed at the state departments of health laboratories apply with equal force to the municipal and private laboratories, as the second paper by the Evaluation Committee⁶ clearly showed.

Remedies for Unsatisfactory Laboratory Work

At this time it is well to remark that it is only in the United States that serious attempts are being made to improve laboratory conditions. The Evaluation Committee, in its third report,² has made very definite rec-

ommendations with a view to correcting the unsatisfactory conditions found in certain laboratories.

(1) The Public Health Service should afford the directors of the state laboratories the annual opportunity to have their serological work evaluated.

(2) The state laboratories doing satisfactory work should in turn evaluate the results obtained by other serologic laboratories within their domains. It is more than possible that it may be necessary to certify or even to license serologic laboratories for a space of one year.

(3) Laboratory technicians for serologic work should be afforded the opportunity for training in approved institutions.

The Following Corollaries are Suggested:

(1) Serologic laboratories employ only technicians who have been certified as competent.

(2) Medical students be educated in the collection of blood.

(3) Private physicians learn whether or not their state serologic laboratory has been evaluated by the United States Public Health Service, and what the results were.

(4) In case the state health officer is not participating in the evaluation projects, he should have pressure brought to bear upon him through the medical societies and such organizations as the American Social Hygiene Association.

(5) In case the state health officer is participating, but his results are not satisfactory, pressure should be brought to bear to correct the local laboratory conditions.

(6) In case the state health officer is participating and the results of his laboratory are satisfactory, he should be urged to extend evaluation opportunities to the laboratories within the borders of his state.

Conclusions

It has been demonstrated that a laboratory can perform a test which will recognize some 90 per cent of all cases of untreated syphilis, and should give a false diagnosis of syphilis in less than one-half of one per cent of non-syphilitics, save only if the individual be affected with yaws, leprosy, malaria or relapsing fever. Likewise, satisfactory tests exist for the examination of the spinal fluid.

The serologic test is the most reliable single method of diagnosing untreated syphilis if properly performed, except in very early syphilis. To the health officer "the

Wassermann dragnet" affords the most convenient and least expensive method of learning the prevalence of syphilis in his community.

To be of any value, the serologic test must be reliable. At present a considerable percentage of the laboratories are doing serologic work that either fails to detect many cases of syphilis, or that gives many false positive reactions, or that errs in both respects. These mistakes may be due to defects in the test chosen, to personnel, to laboratory conditions, which thrust too much work on the pathologist, to faulty collection of blood, or to a combination.

Errors on the part of the laboratory may lead to a failure to diagnose infectious or potentially infectious cases, to a faulty estimate of the number of syphilis cases, or may result in the totally unwarranted diagnosis of syphilis being made upon non-syphilitic subjects, thus causing them needless worry and expense.

In the attempt to correct faulty diagnostic methods, the United States Public Health Service has not only evaluated individual tests, but offers to the state health officer an opportunity to learn whether or no his laboratory is doing competent serologic work. In return it is obvious that it expects him to evaluate the serological laboratories in his own state if his laboratory work is good. In addition suggestions have been offered to improve the quality of technicians in serologic work.

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Experiences with Venereal Disease in Minnesota Penal Institutions

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THE STATES of Minnesota and California were the first in the Union officially to start programs for the control and treatment of syphilis and gonorrhea. Dr. Harry Irvine, of Minneapolis, pioneered and directed both campaigns in this new field. It was my privilege to work under him, and through his influence I became interested in venereal disease and its various problems. Minnesota's campaign against venereal disease has shown definitely favorable results. This is disclosed by an approximate 50 per cent decrease in the incidence of cases reported in 1936 as compared to 1924 and 1925. In 1925 the State Board of Health Laboratory conducted some 40,000 Wassermann tests, of which 17 per cent were positive. In 1936, more than 80,000 blood tests were made, with only about 6 per cent positive. Ten years ago, clinical cases for demonstration to the students in our medical school were numerous. During 1936, according to Dr. Henry Michelson, clinical lesions of active cutaneous syphilis could not be demonstrated in more than about 35 cases.

My own experiences with inmates in the penal institutions of the state are similar. Whereas formerly numerous cases were admitted to the institutions with demonstrable skin lesions of syphilis, we now see these more seldom. The results of Minnesota's campaign against syphilis so far should, indeed, be gratifying to the men who directed the work, as well as to their co-workers.

The varied experiences recounted below must naturally be interpreted as pioneering experiences. It is to be expected in a new field that such occurrences as related take place, even though in retrospect some of them may seem almost ridiculous. Through publicity in the newspapers and magazines, and by other means, the public has become at least partially educated and aware of the seriousness of the problem of venereal disease resulting in a more or less general acceptance of anti-venereal campaigns. From 1920 and for several years I was in charge of a venereal clinic for women at the Minneapolis General Hospital. At that time I also began my work in Minnesota state institutions.

It may be of interest to know how this came about. One night, a young Jewish girl, recently paroled from a girls' training school, presented herself at the clinic with a letter from the social service department of the State Board of Health, requesting treatment for syphilis. Treatment had been started at the institution. This girl was refused treatment until further notice, inasmuch as my examination failed to disclose any history or symptoms of syphilis. The blood test was negative. Her story was that she had had a sore on the lip, which had healed in a week's time, and before institution of treat-

ment. It had been diagnosed by a doctor as a chancre of syphilis, but no dark-field test had been made. Correspondence with the social service department demanding treatment ensued; but I stood by my refusal to treat unless further evidence was forthcoming that the girl actually had syphilis. In one of the letters, the director of the venereal division was urged to make an investigation of this institution, inasmuch as it was my opinion that something was radically wrong there. This conviction was strengthened by another occurrence. I had had a young clandestine prostitute arrested because of delinquency in her treatment for syphilis. At the last visit, recurrent secondaries were present. She had been committed to this institution expressly for treatment. Some six months following her commitment, the social worker at the clinic during a visit to the school had learned from the girl that she had had no treatment whatsoever from the time of her arrest.

During the summer of the previous year, an elderly woman doctor, who had been out of active practice for years, had visited the clinic to learn something about the handling of venereal disease, inasmuch as she was to become an institution physician. She was urged to stay a longer period of time, but after only a few visits informed me that she had seen enough and thought herself ready to treat venereal patients. Her institution was the above mentioned training school. Before long she ran into trouble in giving neo-salvarsan injections, but, incidentally, according to her reports, had done a fine piece of work with the gonorrheal cases. On her arrival at the institution, ninety girls were under treatment. After one month she had managed to cure fifty of these girls, leaving only forty to treat. This naturally appeared favorable, and the superintendent congratulated herself on having found such a competent doctor. Arrangements were made to have a man from the State Board of Health make visits at the institution and help the doctor with the injections. He, however, made no diagnoses. During the previous summer, all anti-syphilitic treatment had been held in abeyance, the excuse being that the weather was too hot to treat syphilis. The doctor, however, did not last long in her position. The superintendent came in search of a doctor to take charge of the venereal cases until a permanent doctor could be found. The author was employed. It had been explained that there were about twenty-five cases to treat, and that these were not bad. In my mind developed the idea of a couple of hours' work and then a nice little fishing trip on a near-by lake. To me this seemed as ideal an arrangement as a young doctor could wish. The vision of fishing trips, however, quickly faded. I arrived at the institution the following week, but instead of twenty-

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five girls, the small hospital was literally mobbed with girls clamoring for attention. A survey was conducted, disclosing out of a population of about 325 inmates that 185 girls had active gonorrhea and some forty girls syphilis!

Up to that time I thought that I was reasonably well-acquainted with gonorrhea; but what I saw here was enough to strike horror in my soul. Purulent, stinking discharges, cervical erosions, boils and eversions, secondary infections, severe pelvic complications. I realized that, with reference to venereal disease, this institution was nothing less than a "pest house." I reported to the director of the division of venereal disease, recommending that he arrange for a meeting with the State Board of Control.

On the basis of my report, I was employed to try to clean up the situation. I accepted, but with the feeling that the board members thought: "Here is a young hopeful who is trying to create a job for himself." I immediately went to work, and that with glowing enthusiasm. Four temporary douche compartments were installed, with the recommendation to the superintendent that twenty-five additional compartments be provided. But month followed month, and no matter how much I urged and prayed for these additional treatment compartments, nothing happened. The opposition of ignorance had gone to work. The State Board of Health had regulations to the effect that syphilitic girls, who had had enough treatment to assure non-infectiousness, could be paroled, if arrangements were made for their continued treatment. But the gonorrheal cases were not to be paroled until pronounced cured. And with these regulations, some very dramatic occurrences began. The superintendent informed me that she was not going to have her school made into a venereal institution. The answer was that it was already such. She enlisted the aid of the board of women visitors. This board was composed of ladies appointed by the governor from various parts of the state for the purpose of inspection, *etc.*, of women's institutions. These ladies, probably meaning well, would come to the institution and question the girls as to my treatments; whether they were hurt by my examinations; if they liked the treatment; *etc.* Soon considerable opposition to the treatments had been engendered. One girl, who had shot and killed a man, refused to be examined and finally, in a rage, flew at me, clawing at my eyes. She was subdued and found to have syphilis; but after the examination she promised that if it took her to her dying day, she would take revenge. Several years later this young woman walked into my office in Minneapolis accompanied by a small, thin, gangstery-looking man. His hands were in his overcoat pockets. I thought I could see the bulge of the gun. The girl finally spoke in a friendly manner, introducing the man as her husband, requesting a blood test for both. Incidentally, as she left she thanked me sincerely for what had been done for her, including the protested examination for which she had threatened violence.

The ladies continued their opposition for about a year. A doctor who could not cure gonorrhea in three months was no good. They complained to the governor. They complained to the Board of Control. They complained to the State Board of Health, attempting in their ignorance to have the whole work stopped. Especially, they opposed the rule keeping girls infected with gonorrhea at the institution until cured. Finally, Dr. Irvine informed them he would recommend parole, provided they would take such girls into their own homes. This board was finally abolished and the opposition ended. Now families and friends of inmates began employing political pressure to affect release. One day, a state official appeared in my office seeking release of a daughter of one of his constituents. The records were not at hand, but he absolutely assured me the girl in question did have syphilis, but not gonorrhea. On the strength of this, release was recommended. On my next visit to the institution, this girl was found to have a most serious gonorrheal case. The Board of Control was notified and the release nullified. The official returned shortly, this time in a rage. On not being admitted immediately, he proceeded to kick the door, bellowing to my secretary that he was Mr. So-and-So, who had no time to wait for any underling of a doctor. As a result he was requested to leave the office. Of course, a letter from the chairman of the Board of Control followed, in which he vividly stated his opinion of the whole affair and inquired how long it would actually take to cure a case of gonorrhea. He felt that this particular girl had been treated long enough. I replied, offering my resignation but requesting, however, that before the resignation be accepted, the women members of the board visit the institution. The two ladies came, and one sat down beside me at the examining table to see the actual cases.

After only a few cases she threw up her hands and said: "Is it actually possible in civilized times that we could have anything like this in one of our own institutions?" She advised me, "Don't resign. Forget any unpleasantness. This is the institution in which I am particularly interested, and these conditions must be corrected. You shall have my support and whatever you need."

What I had begged for for eight months, supplies and moral support, were obtained within a few days. As a result we managed to clean up the worst of the situation within a year's time. This training school is today from a venereal standpoint an ideal institution. But it took educating and interesting the right people to bring this about.

I have some 200 records of syphilitic girls treated and pronounced cured. It is my ambition, if funds could be obtained, to have these girls, many of them now married and mothers, re-examined to check our results. The story just told has not been recounted for entertainment or sensationalism. There are some definite lessons to be learned.

In 1934, a venereal survey of the larger Minnesota penal institutions was undertaken. The purpose was to

ascertain the incidence of venereal disease and to improve prevalent methods of treatment. Treatment of venereal diseases had been in effect for many years, but it was apparent from the annual reports that more cases would be found infected than were under treatment. I have reason to be complimentary to the Minnesota State Board of Control, inasmuch as they pioneered in institutional venereal disease control several years before the Federal Government began the present nation-wide campaign.

Every inmate was examined by me personally. We started with a check of the known syphilitics. All who had received treatment for syphilis were called for a private interview. Complete case histories and examinations were made. Previous to the survey, only meagre records of the infected men were kept. No details of examination, diagnosis, or treatment appeared on the records, the only indication being a check mark after the word "syphilis". A record blank was made in the shape of a folder with space for the history, examination, laboratory tests, treatments in detail, progress, opinions and recommendations, *etc.* In addition, a larger wall-chart log was made on which is entered the treatments from day to day. This was done to facilitate treatments and eliminate loss of time.

A report on the condition of each man was sent to the head of the institution for incorporation in the general file. A copy was also sent to the venereal division of the State Department of Health in order to furnish information helpful in tracing contacts. When the inmate comes up for parole, a letter indicating the man's present status, with reference to venereal disease, is furnished to the State Board of Parole. In this connection, may I say that had it not been for the fine attitude of this board, we would not have succeeded in handling some of the difficult cases. When the Parole Board learns that a man has refused diagnostic tests or treatments, action is delayed until coöperation has been obtained. Only a few examples like these were necessary. Information quickly spread to others and a noticeable change in attitude was seen.

A survey of this type cannot be carried out without a tremendous amount of secretarial work. Civilian stenographers would have been too expensive, especially as it soon became evident that the work would have to go on. Inmate stenographers were carefully chosen, keeping in mind both ability and integrity. Gradually, as the secretary learns his job, he becomes more and more trusted and valuable, and my personal recommendation follows him when he goes out. But we have so far been lucky in this respect. It is realized that the use of inmates in this capacity is subject to criticism. It is indeed difficult to find among inmates a person to trust. Civilian stenographers are to be preferred, and the doctor must have a secretary. Busy doctors have always found history-writing and record-keeping irksome. I believe that their time can be used to better advantage.

As to the findings, I shall not burden you with many figures. According to the prison physician's report for

the previous biennium, there were under treatment in the prison ninety cases of syphilis, and only two cases of gonorrhea. The survey disclosed a total of over 200 cases of syphilis, almost 14 per cent.

Of these, 114 men were in the institution at the beginning of the survey, one-half of whom showed involvement of the central nervous system. As to gonorrhea the survey disclosed 173 men, or nearly 12 per cent, infected with this disease or its complications and not cured. Of these, 96 were in the institution when the survey started, most of whom were suffering from prostatitis, epididymitis, *etc.*, giving rise to difficult treatment problems. At the State Reformatory for Men were found 44 cases of syphilis, and 77 new cases were admitted during the survey, a total of about 5 per cent. Here was found almost 8 per cent of gonorrhea including both groups. At the reformatory no previous statistics on venereal disease were available.

At this point I would like to discuss briefly the meaning of these findings. First of all, at neither institution had adequate examinations for venereal or other disease been done. Questions relating to the most common diseases were recorded, but apparently the word of the inmate admitting or denying venereal disease had been accepted. Routine urinalyses were not made, and hence, if a man denied gonorrhea, this was the end of the matter. At the Prison, routine Wassermann tests had been in vogue, but diagnosis of syphilis was made on single positive blood tests. At the Reformatory, only an occasional Wassermann test had been taken. At the Prison, the syphilitics had received some treatment; usually one course in the spring and another in the fall, treatment being discontinued after the first negative Wassermann. No spinal punctures had been made. As a result, in a great percentage, neuro-syphilis had developed. With reference to jobs no cognizance of venereal disease had been taken. For example, one Negro, with far-advanced paresis, was found wielding the razor on the barber line. This man "blew up" during the survey and had to be put in the detention ward. Many infected men were employed as food handlers. One noon, my own lunch was served by an infectious syphilitic inmate. The treatment for gonorrhea had been most inadequate. Even if a man reported a discharge, he was furnished only with a supply of methylene blue pills or sandalwood oil capsules. There was no segregation of these men, and if the patient did not report of his own accord, he was truly in this respect a "forgotten man." At the reformatory, not even a semblance of adequate treatment for syphilis was given. The most was an occasional course of bismuth or mercury. The State Board of Health had traced a number of infections contracted from inmates released from this institution.

I realize that I have painted a dark picture, but a few darker colors could be added. It would appear that this description is discreditable to the state of Minnesota and it is, or rather *was*. I warn you, however, that Minnesota has plenty of company in this respect, and this opinion is backed by well-founded reports. We have changed the picture, and an invitation is extended to

visit these various institutions and see what has been done to correct a bad situation and to obviate the possibility of its recurrence.

At this point I would like to discuss some of the factors that help produce the problem. Minnesota institutions have been and are governed by a board of control whose members are fully as humanistic, as alert, as fair-minded, and as anxious to conduct good institutions as any similar board; and still such conditions as described may develop. The primary causes, I believe, lie with the medical personnel. The heaviest blame falls on the institution doctor. An M.D. degree is no guarantee that the doctor has more than a very dim knowledge of venereal disease. It is not easy to obtain competent doctors for institutions. First of all, insufficient remuneration, and secondly, poor chances for advancement and improvement, are no inducements to attract competent men. It is often difficult for them to leave their institutions to attend medical meetings, and still more difficult to go away for review courses or short courses in various subjects, which are so necessary for the doctor.

A factor that plays a large part is the attitude of the superintendent. For example, one superintendent suggested the desirability of a venereal survey at his institution. He did everything possible to facilitate the work, and thus enabled us to complete it in a short time. Naturally, this man was credited as forward-looking and progressive. Another superintendent was opposed to the survey. He felt that, inasmuch as the men had not acquired venereal disease in his institution and, anyhow, in all probability would become reinfected as soon as released, there was little use in making much ado about treatment. There were complaints that the medical expenses had increased, that working schedules were interfered with. We were even threatened with an investigation from the state legislature. I met this as diplomatically as I could, replying that such an investigation might be a two-edged sword. Suppose I related the case of the inmate whose unexamined and untreated gonorrhea resulted in permanent total blindness? What

would be the explanation of the excessively high percentage of late complications of syphilis?

"Would you tell the committee these things?" was asked.

I replied, "Naturally, we would have to disclose our findings."

One criticism brought up was that it appeared as though we were giving criminals better treatments than were available to the public. And temporarily this may be true, but we have learned that compromising or even temporizing with syphilis does not pay. Minimum standards have been established, and any lowering of these results in disaster. I have collected a group of cases where murder was definitely traceable to syphilitic disease. A certain man was in prison 8 years ago. The records shows a positive Wassermann test, but no treatment. Last year he received a life sentence for a very peculiar murder. Had this man been properly treated during his first commitment, this probably would have been prevented. On my examination he was found to be a demented wreck, not even fit for the prison. It is my observation that paretics under the influence of liquor develop an easy trigger finger. And we have no right to jeopardize the public by paroling or freeing inmates who might spread disease or commit severe crimes due to untreated disease. Similarly disgraceful situations without question exist in institutions in other states. Minnesota's program, with reference to the care of venereally-infected inmates in penal institutions, has been accepted very favorably by the inmate population. Many letters of appreciation have been written to the State Board of Control and the superintendents, and naturally the effect on the paroled or discharged inmate has been excellent when he can return to society with reasonable assurance that he has been cured from a dread disease.

It is to be hoped that syphilis and gonorrhea will soon be relegated to their proper place among the rare group of diseases, among which we now number typhoid fever and diphtheria. "The next great plague to go is syphilis."

The Routine Wassermann Test in College Students

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THE IMPORTANCE of syphilis as a public health problem has been brought before the public more forcibly than ever before, during the past two years. Dr. Thomas F. Parran, surgeon-general of the United States Public Health Service, has emphasized the importance of the problem and has stated his belief that syphilis can be controlled as well as tuberculosis has been, as soon as the public health authorities, the medical profession, and the general public will unite in their efforts toward eradicating this disease.

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Fortunately in the Wassermann test or its modifications we have a relatively reliable, simple method of case-finding for syphilis which is especially valuable in those in whom the disease presents no characteristic symptoms. The importance of including a Wassermann test routinely as a part of every physical examination, whether it is a routine health examination, a pre-natal examination, or the examination of a person with a broken leg has been stressed repeatedly. Only comparatively recently, however, has much interest been shown in including the Wassermann test as a part of the physical examinations given thousands of young men and

women in our colleges and universities. In a recent national survey of health services in which one-hundred-fifty-one schools participated, only seven colleges reported doing routine Wassermann tests. At the last meeting of the American Student Health Association in December of 1937, a discussion of the subject of the use of routine Wassermann tests in the examination of college students brought out the fact that many schools do not require a Wassermann test but offer it on a voluntary basis and that a large proportion of students take advantage of the opportunity to have the test. The University of Wisconsin reported that the *Reader's Digest* campaign brought to the Student Health Service 3,400 volunteers for a Wassermann test.

Since 1927, the Wassermann test has been done routinely as a part of the periodic health examination for all students except the entering students at the University of Minnesota. In the fall of 1936, the test was included in the entrance physical examination required of all entering students as well. The Wassermann tests were performed by the laboratory of the State Department of Health. No student was considered to have a positive reaction unless several tests were persistently positive. Diehl^{1,2} in 1931 and 1936 reported on 10,000 routine Wassermann tests done at these periodic health examinations. The percentage of the positive Wassermann reactors in this group of 10,000 was 0.025, a very low incidence compared to that found among other groups in the population tested routinely.

During the academic year 1936-37, a total of 9,064 students, or approximately 64 per cent of the student body at the University of Minnesota, were given Wassermann tests as a part of a routine physical examination. Of this number 4,131 were newly-entering students, most of whom were freshmen. A total of 15 with persistently positive Wassermann reactions were found in the entire group, giving an incidence of positive reactors of 0.165 per cent. There were nine positive reactors among the men and six among the women. Of the 15 cases, eight had been diagnosed previously and seven had not known of the infection.

TABLE I.

Wassermann Tests—1936-37—University of Minnesota Students.			
	Total Number Tested	Number Positive	Percent Positive
Men	5,437	9	0.165
Women	3,627	6	0.165
Total	9,064	15	0.165

Treatment for these 15 students was arranged either through the Health Service or private physicians.

In addition, five other students with positive Wassermann tests were carried over from the preceding school year, and were observed or treated during the year 1936-37, making a total of 20 known Wassermann-positive reactors in a student body of approximately 14,000 students.

With the 9,064 routine Wassermann tests done on University students during the academic year 1936-37, and the 10,000 reported by Diehl among students in this same institution, we are able to report on the incidence of positive Wassermann reactors in more than 19,000 University students. In this total group of 19,064 stu-

dents, 39 or 0.2 per cent, had persistently positive Wassermann reactions. In this group of 39 students, 30 had never been diagnosed, and were found as a result of the routine Wassermann test done as a part of the required physical examination.

The question is naturally raised as to whether the time and expense involved in doing routine Wassermann tests is justified among college groups when such a low incidence of infection has been found. From the point of view of the infected individual, there can be no question as to the value to him of learning about the infection and his having an opportunity to have it treated. In our experience, fully half of the cases found to have positive Wassermann reactions either had congenital syphilis or had been innocently infected. A large proportion of the remaining positive reactors did not know that they had the infection. It would seem, therefore, that not only from the standpoint of the individual, but also for the general protection of the public, it is worth while to do routine Wassermann tests on college students even though the rate of infection is very low.

Case-finding in syphilis in this age group can be compared to case-finding in tuberculosis. It is generally accepted now as a part of the routine physical examination of college students that a tuberculin test shall be done and an X-ray of the chest taken on the positive reactor. Obviously, there is considerable time and expense expended in carrying out such a tuberculosis case-finding program. During the five-year period from 1931 to 1935 as a result of an intensive case-finding program, a total of 95 cases of active tuberculosis were found in the University of Minnesota students, making an average of 19 cases per year. Thus, the number of cases of tuberculosis found was but little larger than the cases of syphilis when a routine Wassermann test was done. The cost of the tuberculosis case-finding program was much greater than the syphilis case-finding program.

The educational value of doing Wassermann tests routinely on college students must not be overlooked. If the public attitude toward the control of syphilis is to be changed, so that this disease is to be regarded as unemotionally as any other communicable disease, it is necessary for the public to understand the necessity and meaning of a Wassermann test, and to have this test considered as a usual part of any type of physical examination. Young men and women who have been in our colleges and universities and are familiar with the Wassermann test as a necessary part of a physical examination can do much to help mould public opinion in the fight against syphilis.

Summary

At the University of Minnesota, the Wassermann test is included as a part of the routine physical examination required of all entering students as well as a part of all periodic health examinations.

In a sampling of 19,000 Wassermann tests done routinely on University students during the past ten years, there were 39 persistently positive reactors, or an incidence of 0.2 per cent. Thirty of the 39 students with

persistently positive Wassermann tests were previously undiagnosed.

Although the incidence of syphilis is very low in this group, the value of the diagnosis to the few individuals infected, the educational value of including a Wassermann test as a part of every physical examination, and

the very low cost of having the test done would seem to leave no doubt as to the importance of doing the Wassermann test routinely in the examination of college students.

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What the General Practitioner Should Know About Syphilis*

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SYPHILIS in Minnesota is slowly becoming less prevalent. The number of new cases is getting less and among the well-to-do classes syphilis is becoming a rare disease. This is shown by the results of Wassermann tests done on the students at the University. Very few positive Wassermans were found among thousands of students. Nineteen thousand Wassermans were done and only 17/100 of one per cent were positive.

The first thing to consider in a discussion of syphilis is the diagnosis. A correct diagnosis must be made, and it should be emphasized that a purely clinical diagnosis is not sufficient excuse to subject a patient to three years' treatment for syphilis. No clinical diagnosis of syphilis should be made on a genital sore. All suspicious genital sores should be subjected to a dark-field examination. If this is not available, the doctor should write to the State Board of Health for an outfit, and send the specimen there.

In cases presenting a secondary eruption following a genital sore, or where the eruption resembles a syphilitic eruption, repeated Wassermann tests should be made if necessary. Here a word regarding the interpretation of the precipitation tests and the Kolmer tests should be in order. The Kline test may show an earlier change than the Kolmer, and is of aid in this respect; but it is better to depend upon the Kolmer test and if it is positive, it is safer to repeat this before beginning treatment.

Latent syphilis is usually picked up on doing routine Wassermann tests. When a positive test is found in a patient free of symptoms, the test should be repeated and a spinal test done. A history should be taken and information concerning a genital sore should be elicited, and the amount of any treatment given previously should be determined.

The State Board of Health does the spinal tests with the exception of the cell count. This must be done at once, because the cells dissolve.

Having determined whether the spinal fluid is positive or negative, the treatment can be given either as the regular routine or that for C N S syphilis.

Late syphilis presents about the same problem as the latent cases. Here one must look out for cardiovascular

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syphilis and central nervous system involvement. A thorough physical examination must be made and a spinal test done.

Prenatal syphilis is better prevented than treated after it occurs. A Wassermann test should be made on all pregnant women, and those showing a repeated positive test should be given early and intensive treatment throughout their pregnancy. If treatment is started early the child is usually born free of syphilis.

Treatment

At the Minneapolis General Hospital the treatment followed is that recommended by the co-operative clinical groups and printed by the surgeon-general of the U. S. Public Health Service. This treatment consists of continuous and uninterrupted courses of arsenic and bismuth. We use bismuth salicylate in oil and prefer it to the soluble salts of bismuth.

A seronegative primary syphilis can be treated for two years if the Wassermann reaction remains negative, and if the spinal test is negative at the end of the treatment. All seropositive cases are treated for three years. Four to six injections of neo-arsphenamine are given, and then a weekly injection of bismuth. Usually about eight injections of bismuth make up the course, and then this routine is repeated. Wassermann tests are taken every few months and if they are persistently positive, it is well to do a spinal test and determine if the nervous system is involved. If so a change is made to malaria or tryparsamide. These steady courses of arsenic and bismuth are kept up for three years, and then a spinal is done before the patient is discharged.

Latent syphilis with negative spinal findings are treated the same as the earlier syphilis, and are given three years' intensive treatment. If the Wassermann persists positively, we still consider them as well as they will ever get, and discharge them.

Late syphilis falls into visceral and C N S categories, and the treatment must be directed according to the findings.

Cardiovascular syphilis is best treated first with bismuth and KI. Later, arsenic can be given and treatment should be kept up for several years.

Involvement of the central nervous system by syphilis is one of the major tragedies of medicine. Some form

of fever therapy is indicated here, and we have found that the best results follow malaria. It can be given in all forms of C N S syphilis. We also give it in Wassermann-fast cases. In optic atrophy and syphilitic keratitis, we find that malaria gives the best results with the least relapses. If malaria is not available, typhoid vaccine intravenously can be used, or else some form of mechanical fever production.

We prefer the malaria, and as soon as the patient has recovered, arsenical treatment is started, and later bismuth and the continuous treatments are given. In some cases of C N S syphilis we give tryparsamide in weekly doses for several months. The eyegrounds should be examined before this is started, and from time to time during the treatment if tryparsamide is given.

Prenatal syphilis. For several years we have been treating prenatal syphilis with acetarsone by mouth. Our results have been brilliant, and the mothers have cooperated in bringing the children to the clinic because the children are not hurt and soon get to enjoy their visits. The dosage for the first two years of life is as follows: courses of nine weeks;—First week, 5 mgs. of acetarsone per kilo of body weight daily; second week, 10 mgs.; third week, 15 mgs.; fourth week, 20 mgs.; fifth week, 20 mgs.; sixth, seventh, eighth, and ninth

week, 20 mgs. per kilo of body weight. We found from practical experience that the top dose should not be over two grains per day. Symptoms of diarrhea, dermatitis, vomiting, and loss of weight indicate cessation of therapy for a few days, or reduction of dosage on beginning therapy again. Three weeks' rest is given and then the course is repeated and a Wassermann is taken. We keep this up three years. For children two years or over we give 0.1 gm. per kilo of body weight daily, given in courses as for the younger children. In case diarrhea develops, the treatment is stopped and resumed at a lower dosage.

Conclusions

1. Do not start treating a patient for syphilis until you are sure of your diagnosis.
2. Give continuous treatment consisting of courses of neo-arsphenamine and bismuth. Continue this for three years.
3. Before discharging a syphilitic, be sure that the spinal test is negative.
4. Cardiovascular and C N S syphilis call for individualized and special forms of treatment.
5. All pregnant syphilitic women should be treated early and continuously.

Clinical Study of Chronic Prostatitis

With Hassett Treatment and Results

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IN THE study of twenty-five unselected cases of chronic prostatitis, there were eighteen dispensary patients and seven private patients treated. The following symptoms were the most prominent, namely: patient complained of urethral discharge, frequency, burning, hesitation and one case of hematuria. The sexual symptoms complained of were partial impotence, libido decreased, premature ejaculation and painful ejaculation. In one case the chief complaint was sterility.

Diagnosis of chronic prostatitis was made from the history, rectal examinations and examinations of prostatic secretion before and after treatment. All prostatic secretions were examined bacteriologically with the following technique: the glans was washed off with a solution of biniodide of mercury 1 to 5,000, and the urethra irrigated with 1 to 5,000 solution of potassium permanganate. Prostatic secretion was obtained by prostatic massage and the secretion cultured on blood agar serum.

The majority of organisms found were those of the colon group. Nine were found to be identified with *Bacillus coli* organism, nine of the staphylococci group, two the *Diphtheroid bacillus*, one *Bacillus alkaligenes* and

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four were not identified. The prostatic secretion was examined under the high dry lens and the pus cells were enumerated. Microscopic examinations were carried out bi-weekly while the patients were under treatment. Microscopic examinations of the urine of all patients were examined at least once weekly. Complications encountered while patient was under treatment consisted of nine cases of urethral strictures, and two cases of epididymitis. One prostatic abscess was treated by perineal incision; later by heat application. Two patients had marked increase in joint symptoms which may have been due to a previous gonorrheal arthritis. With attention directed to prostatic massage the joint symptoms cleared up.

Associated Pathology

On cystoscopic examination, the majority of these patients showed contracture of the vesicle orifice and trigonitis. The rectal findings showed varying degrees of induration and evidences of peri-prostatitis. The patients were given appropriate treatment for strictures, the urethra being dilated once weekly. All patients were treated with the Hassett massage bar and by means of attachment, local heat was given to each patient to the degree of personal tolerance. The patients showing infection at the beginning of treatment required on the

Case	Age	Previous Venereal Infection	Symptoms	Diagnosis	Bacteriology	Microscopic examination of Prostatic Secretion before treatment	Microscopic examination of Urine	Complications	Examination of secretion after treatment	Rectal Findings	Results
1.	28	G.C. 5 yrs.	Urethral Discharge Dysuria	Chronic Prostatitis	B. Coli	50-60 pus cells per High Power Field	3-5 W.B.C.	Stricture	6-8 pus cells per High Power Field	Prostate first degree induration	Improvement
2	30	G.C. 15 yrs. ago	Perineal pain Supra-pubic pain	Chronic Prostatitis	Staphylococcus	20-30 pus cells per High Power Field	2-3 W.B.C.	Negative	2-3 pus cells per High Power Field	Prostate Vesicles indurated. Prostate hard	Marked Improvement
3	35	G.C. 18 yrs. ago	Perineal pain. Itching sensation	Chronic Prostatitis	B. Coli	Pus in clumps 100 per H.P.F.	6-8 W.B.C.	Negative	10-12 per High Power Field	Hard first degree induration	Symptom Free
4	28	G.C. 1933—4 yrs.	Urethral Discharge Frequency	Chronic Prostatitis	B. Coli	20-25 per High Power Field	2-3 W.B.C.	Stricture	2-3 per High Power Field	Non-Elastic Nodular	Improved. Discharged cured
5	40	G.C. 15 yrs. ago	Lumbar pain Nocturia	Chronic Prostatitis	Diphtheroid	30-40 per High Power Field	1-2 W.B.C.	Left Epididymitis	4-5 per High Power Field	Small non-elastic second degree induration	Symptoms improved
6	52	G.C. 20 yrs. ago	Lumbar pain	Chronic Prostatitis	Staphylococcus	40-50 per High Power Field	3-5 W.B.C. 1-2 R.B.C.	Negative	5-6 per High Power Field	Irregular and hard	Discharged cured
7	35	G.C. 5 yrs. ago	Frequency Urgency	Chronic Prostatitis	Staphylococcus	Clumps of Pus	4-5 W.B.C.	Stricture	4-6 per High Power Field	Hard Nodular	Moderate improvement
8	42	G.C. 20 yrs. ago	Nocturia Urethral Discharge	Chronic Prostatitis	Staphylococcus	60-80 pus cells per High Power Field	2-8 W.B.C.	Negative	8-15 per High Power Field	Tender large and boggy	Moderate improvement Symptom free
9	28	G.C. 5 yrs.	Nocturia Frequency	Chronic Prostatitis	Diphtheroid Bacillus	50-60 pus cells per High Power Field	3-6 W.B.C.	Stricture left Epididymitis	8-10 per High Power Field	Hard — Regular second degree induration	Stricture dilated Marked improvement Discharged cured
10	38	G.C. 20 yrs. ago	Pain & burning. Loss of libido	Chronic Prostatitis	B. Coli	30-40 per High Power Field	5-6 W.B.C.	Stricture	8-10 per High Power Field	Prostate firm, elastic irregular	Urethral dilatation Symptoms improved Satisfactory
11	45	G.C. 12 yrs. ago	Frequency Nocturia	Chronic Prostatitis	B. Alkaligenes	40-50 pus cells per High Power Field	8- W.B.C.	Verumontanum congested AgNos application 10%	4-5 pus cells per High Power Field	Prostate small, firm elastic	No symptoms discharged cured
12	51	G.C. 20 yrs. ago	Dysuria Nocturia	Chronic Prostatitis	Gram negative rods	100 per High Power Field	5-6 W.B.C.	Filiform stricture	10-12 per High Power Field	Prostate small — fibrous type	Gradual dilatation of urethra. Symptom free. Discharged improved
13	36	G.C. 10 yrs. ago	Urethral Discharge Dysuria	Chronic Prostatitis	Not identified	50-80 pus cells per High Power Field	8-10 W.B.C.	Stricture	8-10 per High Power Field	Prostate soft, hoggy tender	Urethra dilatation Marked improvement
14	48	G.C. 3 yrs. ago	Dysuria Perineal pain	Chronic Prostatitis	B. Coli	60-70 pus cells per High Power Field	Negative	Negative	5-6 per High Power Field	Prostate enlarged tender	Discharged cured. Results good
15	32	G.C. 5 yrs. ago	Frequency Nocturia	Chronic Prostatitis	Diplococcus	150-175 per High Power Field	10-12 W.B.C.	Stricture	10-12 per High Power Field	Prostate enlarged, nodular, hard vesicles indurated	Greatly improved Symptom free
16	26	1 year 1 attack 1929	Lumbar pain Dysuria Frequency	Chronic Prostatitis	Not identified	20-25 pus cells per High Power Field	Negative	Stricture	6-8 per High Power Field	Prostate firm, indurated	Urethra dilatation Marked improvement
17	53	None	Perineal pain supra-pubic pain	Chronic Prostatitis	B. Coli	10-15 per High Power Field	Negative	Negative	2-3 per High Power Field	Prostate enlarged, soft vesicles indurated	Marked relief from symptoms. Cystoscopy small median bar
18	55	G.C. 25 yrs. ago	Urethral Discharge	Chronic Prostatitis	Staphylococcus	50-60 per High Power Field	3-5 W.B.C.	Negative	6-8 per High Power Field	Prostate enlarged, hoggy tender	Cystoscopy revealed contracture vesicle orifice—improved
19	35	First attack 1928; 6 attacks since	Urethral disch. burn'g & frequency Supra-pubic pain	Chronic Prostatitis	B. Coli	50-70 per High Power Field	5-6 W.B.C.	Stricture	8-10 per High Power Field	Marked periprostatis	Urethral dilatation symptoms improved
20	42	G.C. 25 yrs. ago	Hesitation Frequency Nocturia	Chronic Prostatitis	Staphylococcus	20-25 per High Power Field	5-6 W.B.C.	Urethral stricture Multiple urethral S. Perineal Fistula	4-5 per High Power Field	Prostate firm, fair consistency	Urethral dilatation Symptoms greatly improved Discharged cured
21	25	G.C. 6 yrs. ago	Urethral disch. freq'y hesitation urgency	Chronic Prostatitis	Staphylococcus	50-100 per High Power Field	3-4 W.B.C.	Urethral Stricture	6-7 pus cells High Power Field	Prostate enlarged, hard; 2nd degree induration vesicles soft and fluctuant	Prostate normal, soft, elastic, vesicles not palpable. Symptoms improved. Disch. cured
22	42	G.C. 20 yrs. ago	Frequency Ureth. disch. premature ejaculations	Chronic Prostatitis	Staphylococcus	15-20 per High Power Field	5-6 W.B.C.	Negative	5-6 pus cells per High Power Field	Prostate firm and hard	Discharged cured
23	36	None	Urethral discharge burning	Chronic Prostatitis	B. Coli	20-25 per High Power Field	5-6 W.B.C.	Negative	10-12 per High Power Field	Prostate small elastic	Symptoms disappeared Patient discharged cured
24	38	No previous history of V. infection	Perineal pain Dysuria Hematuria	Chronic Prostatitis	B. Coli and Staphylococcus	10-12 per High Power Field	Numerous pus cells in clumps	Prostatic abscess 2 yrs. prev.	4-6 pus cells per High Power Field	Prostate firm; first degree induration vesicles not palpable	Perineal drainage for prostatic abscess 2 yrs. prev. Symptoms free
25	44	No history of previous G.C.	Fatigue and relative impotence	Chronic Prostatitis	Not identified	15-20 per High Power Field	Negative	None	3-5 pus cells per High Power Field	Prostate small fibrotic in type; first deg. indur. fibrotic	Considerable improvement. Sexual symptoms improving

average approximately three months' treatment to obtain a marked reduction in the diminution of pus cells in the prostatic secretion. It was thought fair to assume that a patient having eight to ten pus cells per high power field was about normal. The value of repeated microscopic examinations of prostatic fluid is emphasized, because only by this means are we able to determine the progress of the patient.

Of the twenty-five cases treated, the majority improved symptomatically. The patient reported as having a pros-

tatic abscess did not develop the same while under treatment with the massage bar. Digital massage and the application of heat by various methods have been the sheet-anchor of the treatment of chronic prostatitis from time immemorial. Massage empties the prostatic ducts, stimulating absorption, while heat generated by means of the Hassett applicator brings an increased blood supply to the prostate. It is a very valuable adjunct, and is easily applicable to all types of patients in the treatment of chronic prostatitis and seminal vesiculitis.

Student Health Service in the University*

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I. The University's Philosophy of Education

THE RELATIONS between an university and its student health service cannot be understood without an understanding of the institution's basic philosophy of education. Without attempting finer and more minute discriminations, our institutions as a group are organized on either one of two basic conceptions; either that the university is the outgrowth of the will of the people and is, therefore, intended as the expression of the democratic ideal to give equal and abundant educational opportunities to all; or that the university is the expression of the idealism of the leaders and is, therefore, intended to give opportunities for the highest self-determination to a restricted number of superior individuals. There are, to be sure, relatively few institutions in which these type forms find a pronounced and consistent embodiment, rather there are intergrades and variant almost without number, many of them expressive of historic compromises in response to nature's and society's seeming abhorance of "the pure type."

In an institution built upon the first of these structural principles, that is, the democratic or perhaps better the demophylic university, the student health service must also express in its policies and in its activities the whole institution's desire to serve the entire student body for which the institution has after all assumed in the name of the state and, apparently, in more and more centers, also for the state, the obligations of guiding the maximum numbers of its citizens consistently with *minimal* standards to the achievement of some degree of educational distinction.

In institutions organized on the second principle, the aristocratic principle or again better, the aristophylic principle, the student health service becomes the expression of the institution's desire to lead a carefully selected and painstakingly nurtured and supervised student body to the attainment of that perfection physically, intellectually and morally, to the development of which

such a university has dedicated all its human, financial and material resources. Again, with reference to the student health service, probably one cannot find clear-cut and sharply-defined type activities. Again, no doubt, there are intergrades and variants; nor unfortunately, or perhaps fortunately, do I have statistics available to show to what extent the basic educational philosophy of the institution has consistently found its expression in the form of organization and in the activities of the student health service. No doubt, there are demophylic universities which have developed an aristophylic program in the care of their students; and I know there are aristophylic institutions which have developed demophylic programs in their student health service. Moreover, there are universities in which the aristophylic ideal finds more or less complete expression ranging from those in which the selective process is exercised merely at the student's entry into the university to those in which, given the selection, the student progresses through a determined curriculum with more or less autonomy and independence.

No doubt, these gradations and variations have found their way into the policies and practice of student health services. Similarly, no doubt, gradations and variations are discoverable by the careful student in the institutions based upon the demophylic ideal. As the principle of the state control of the individual exhibits modifications in this or that institution from the principle of the individual's voluntary service to the state at one end of the scale to the individual's complete integration into the state at the other end of the scale. Whether or not these distinctions and discriminations have been carefully harmonized in the student health services of the various institutions with the corresponding basic philosophy of those institutions, is a matter which only the most careful study can detect. What is more likely is that the response to immediate needs in the organization of student health services has kept these services rather closely within the established organizational framework of the university as a whole but that within that framework, the processes of assimilation and adaptation have produced sub-patterns which are not always completely

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consistent with the details of the pattern developed by the institution as a whole. The phenomenon which we find in the organic world finds a counterpart in our social forms. Frequently enough, organological evolution does not parallel ontogenetic evolution just as the latter frequently enough, does not parallel phylogenetic evolution.

But to leave these abstruse considerations and to translate them into a more concrete and we hope, into a more intelligible discussion, our student health services manifest a wide variation in their organizational patterns, in their basic concept of the health service's place in the university, in their functional programs with relation to the student and with relation, furthermore, to the student-teacher relationship, to the degree of responsibility for the integration of health programs with academic programs and as well to a countless series of similar details which surely, it is scarcely my place at this moment to review. I have been greatly impressed with this variability in visiting schools and I have been impressed also with the value of encouraging this diversity of development. After all, student health services in our educational institutions have not as yet passed beyond the state of experimentation. Whatever fundamental principles we may have developed with reference to their organization and administration, they have not as yet reached that point of formalization which has been achieved, some persons would say unfortunately, by other features of the educational program. Even so, we may, nevertheless, feel assured that certain general attitudes towards the student health program are already emerging and that these, no doubt, while they may still be in a sort of negative form, emphasizing the occurrence of developments which would probably be regarded generally as undesirable, are still shaping themselves into positive conclusions.

The important thought which I wish to leave with this audience as the conclusion of this speculative part of my paper is this, that in the development of student health services, diverse patterns are in the process of evolution. Without wishing in any way to exercise constraint upon this developmental process, a word of caution should, nevertheless, be said concerning the direction which that development should take in diverse kinds of institutions. For the most part, it will probably be agreed by all that the pattern of the student health service should conform in its general outlines and purposes to the objective, structure and the administrative procedures of the college or the university in which the student health service is located. A pronounced dissimilarity in these respects between the health service and the parent institution may result not only in an ineffective health service, but may imperil those phases of the institution's activities, for example, the guidance program, of which the health service should form a part.

II. The Educator in Loco Parentis

The concept of the educator *in loco parentis* was taken very seriously in the days when education was more generally accepted as being the responsibility of

the parent. In our own country for more than a century after private schools were organized, there were as yet no state schools and the emphasis upon individualized responsibility for education, therefore, has ingrained itself into our attitudes towards education, so much so that even our public or governmental school system regards itself as exercising in greater or less measure, a parental function. This is not the place to analyze minutely how even a tax-supported institution which owes its origin and its maintenance to the popular will, reaches an equilibrium between service to the people as a whole and service to the individual taxpayer. It is apparent, nevertheless, that even such schools must and do regard themselves as carrying out the wishes and the will of the individual parent. Whatever such a minute analysis might yield, it is probably more profitable here to review the implications of the phrase that the educator is acting *in loco parentis*. The term obviously and perhaps fundamentally, emphasizes, first of all, responsibility in the educational process. Even in our rapidly shifting attitudes towards the parent-child relationship, no one has as yet seriously propounded, at least for our country, as a principle and as an ideal, the concept that the parent's function is merely to bring children into the world. Rather have we constantly emphasized the responsibilities that are implied in parenthood, so much so, that such a stress upon responsibility has been used as a subterfuge for the avoidance of parental obligations.

Secondly, the phrase *in loco parentis* suggests individuation in the relationship of the educator to the pupil. Just as the parent has a decidedly different attitude towards his or her own children than to other children, so the educator is assumed to have developed a different attitude towards each of the children under his care. The individuating process is the one of all the educational processes which has probably suffered most through our practices in mass education. But fortunately, there are not wanting signs to show that educators are making a serious attack upon this problem, that they are keenly aware of its importance and that they are willing enough to modify those procedures through which so much of the content of our educational programs has been misdirected towards mass and group education.

And thirdly, to regard the educator *in loco parentis* implies adequacy, that is, a measure of completeness in the care which the educator extends to the child. Upon this point again, we may bring countless viewpoints to bear. Adequacy is a relative term as applied to medical care no less than applied to intellectual or moral care. It is relative because it must consider the diverse constitutional equipment, physical and mental and moral of the individual, the social strata from which the individual has emerged, the social strata into which his ambitions progress, the general status of society, economic opportunity, environmental factors of the most diverse kinds, the impacts of adverse and favorable forces upon the individual as well as countless other occurrences, influences and experiences in the life of a child before and

during his admission to the school or to the university. Despite all of this, given the sense of responsibility and the educator's understanding of the individual, sincerity on the part of the educator will enable him in each individual case to understand whether or not his care of the student can be regarded as adequate.

If now we make the assumption that the student health service is part of the educational process, whatever we may mean by that phrase, and if, furthermore, we assume that the student health service, therefore, shares in the functions of the individual educator, the student health service also cannot avoid the implication that it shares in the responsibility of the institution as a whole for the student; that it must assume the obligation for individuating its approach to the individual student; that it must supply that adequacy of service which a greater or less sense of responsibility and a more or less elevated idealism will dictate depending upon the character of the institution of which the student health service forms a part, the character of the student body, the institution's educational program, the sincerity of the university's administration and perhaps many other characteristics of the institution of which it forms a part.

III. Service of the Student Health Service

We would all admit that health care is in reality not what is popularly understood by health care. The vistas for human betterment which have been opened to us by the newly developing concepts of preventive medicine, by our growing insight into the meaning of constitution, by our better understanding of the unity of the human organism and in general, by ever so many developments in medicine, have taught the forward-looking physician that health care is in reality, the care of the man as a whole. The student health service in the university should be, I should say, the fullest expression of the institution's attitude towards preventive medicine in its most ideal phases. There was a time, now, fortunately, rapidly passing, in our more carefully organized health services, when the annual report gave us statistics on the number of defects found in our students and the percentage of corrections of those defects. That was a necessary phase, perhaps, through which our student health services had to pass, but how naive such reports sound to us today in the light of our deeper understanding. We are beginning to realize that in the student health service, an understanding of the student's constitution, of his organic condition, of his psychological characteristics, emotional as well as intellectual, of his social environment, and of his educational influences must all converge thus to produce a complete image of the student in the record of the health service. And all this must be done not for any other reason than that the individual student must be understood by someone in the university in which perhaps, thousands of other students form a sea of humanity in which one single personality may well be submerged. All of this must be done because all of this has its effect upon the educational resultant and upon the processes through which that resultant is achieved. No one who is even casually

familiar with student health services has not encountered the attitude that student health services are unnecessary because the student comes to the school with a health certificate from his family doctor. What a difference there is between such reports as are received as health certificates and the findings of a real conscientious university student health service. The health certificate may be of absolutely no educational significance no matter how favorable its details may be to the student or how suggestive to the sympathetic and intelligent student health physician who reads it, but if a student health record is non-productive of educational resultants then somewhere the student health service is failing to achieve that for which under the best inspiration, it has been organized. The student health service can afford to ignore none of the factors which may have the health significance and, therefore, an educational significance. I am not saying that the student health service must alone carry responsibility for all phases of the individual's life in school. As a matter of fact, the student health service is not competent and should not be expected, therefore, to deal with all of the influences which impinge upon the student. It is for this reason that the student health service must be integrated into the institution's welfare activity, into guidance programs, and the curricular and extra-curricular activities in the institution. It must be so geared that it will mesh with all of the numerous wheels in the educational machinery in its administrative relationships. But above all, the personnel of the student health service must be such that it will enable the directors of the different activities affecting students to deal with the student problems without losing sight of that wealth of knowledge about the student which the student health service has assembled. The student health personnel must be such that it can deal authoritatively in consultation with the other officials of the university on matters affecting the educational processes.

If this discussion of the amplitude of the student health service is at all significant, it naturally raises the question of personnel preparation. Is it not true that student health officers are rapidly developing into a special group, specialists in the medical field? They are not only physicians who give medical care, or physicians who become diagnosticians, or physicians who have a strong understanding of the social component in medicine, or physicians who understand the psychological implications of disease, or physicians who visualize moral living as essential to healthy living—but they are physicians who must have *all* of these achievements and viewpoints and must still be able to bring the sum total of this knowledge and experience to bear upon the students in the university. I am beginning to understand more and more that the student health physician must be able to give a physical examination that is comprehensive and thorough, but also he must be at the same time, a psychiatrist and a social worker and a nurse and an educator, and that as he falls short of being all of these things, he also falls short of being the best director of a student health service. It is this breadth of sym-

pathy and understanding which characterizes the outstanding director of a student health service in an university. Perhaps he will become more than this as the years develop. He will participate in the institution's educational research, in its achievement research, in its self-surveys; he will have valuable viewpoints to bring to bear upon the interpretation and application of the institution's policies with reference to its student body. With the deepening of his experience, his word will go far towards the formulation of even educational policies in the institution. He will gradually become the embodiment of the institution's responsibility for the educational effects produced in the student in so far as these effects must result from the physical constitution and the health condition of the student himself. He will contribute much to the concepts of educational retardation and educational superiority; towards the understanding of the countless problems of discipline; towards the better administration of academic regulations; he will have a word to say, sometimes the final word, on the choice of this or that individual student for specialized programs; for student participation in various forms of activities. He will thus become coöperatively dominant in the school's administration no less than in the lives of the individual students.

In thus presenting a comprehensive picture of the student health physician, one wonders how many such men can be found who in addition to being good physicians, incisive and prudent diagnosticians, well-prepared and broadly interested internists, are at the same time, educators at least in spirit, student guides at least in their attitudes, public relation experts at least in their interests, friends of the students, humane and wise counselors, diplomats, leaders, scientists as well as humanists? Must the student health physician be all of these? He must be in addition, something of a psychiatrist and something of a public health physician, an epidemiologist and a vital statistician. If I am told I am thinking only of the student health physician of the larger institutions, my answer can only be that the realization of these ideals in the smaller institutions will achieve immeasurable good for student welfare. In the larger institution, there are usually inherent correctives for the inadequacies of any particular staff member; in the smaller institution, these inadequacies may become a threat to educational progress.

Yes, the student health physician must be all I have said of him; if not all of these to the same degree of excellent, at least to some degree. These men must be selected with the utmost caution, since they must be superior in their medical attitudes, one might almost think of them as "specialists" in an even truer sense than the term is applied, for example, to the internist or the ophthalmologist. Unfortunately, we have no word which indicates a man who knows his therapeutics as well as his preventive medicine, who understands the human relations of medicine and the educational resultant that comes from health. Some day such a word may be coined but when that time comes, we may be sure that the word if aptly applied, will include in its significance the deep-

est implications of medical practice for human society, individually and collectively, and the deepest implications of social psychology in its bearing upon both therapeutics and diagnostics.

IV. Integration of the Guidance Program

This naturally, leads us into the question of the place which the student health service occupies in the student guidance program. It must be admitted that in those institutions in which the guidance program is more or less sharply differentiated into academic guidance, vocational guidance and guidance for personal matters, the function of the student health service in each of these divisions is probably considerably differentiated both with respect to administration and with respect to type of service. Leaving these differentiations aside, however, for our present purpose, we may take the guidance program of a college or an university as a whole and view it as that activity through which the institution carries out its obligation to adapt a generalized educational activity to the needs of a specific individual. In such a program clearly, the student health service has a large rôle to play. I would hazard the formulation of a principle that in an organized and coördinated guidance program, the conclusions of a student health officer cannot be ignored and the further principle that the value of the student health officer's contribution towards the guidance program depends upon the personnel involved, the completeness of both the student health and the guidance program, the character of the individual student himself and lastly, the breadth of vision of the institution in dealing with its students through all of the activities which are grouped under the head of student welfare.

It is true that special problems are presented to the student health officer when he attempts to integrate his viewpoints into the guidance of a particular student. A few of these difficulties might be touched upon merely as samples of many others. The maintenance of confidential information in the possession of the student health service sometimes presents serious problems. The confidence of the student body in the student health service must be safeguarded at all costs and yet it is equally true that much of the information in the possession of the student health service would be invaluable to a competent personnel or vocational or spiritual director. I know that each individual case as it arises, presents special problems. It is highly important, it seems to me, not to divulge knowledge which is strictly medical to non-medical persons, and this not merely because of the ethical implications but also because sometimes even well-educated and highly intelligent lay persons develop a distorted attitude towards a medical problem. Just two days ago, for example, a person for whose knowledge and scope of information and judgment I have the highest regard, could not understand why there should be need for individuation in advice in dealing with an anemic patient, since, as this person said, the problem of anemia has been solved by liver extracts. Such naive statements on the part of laymen are of course very common among readers who peruse the popular digests.

The fine discriminations, the weighing of probabilities, the consideration of alternatives in approaching a disease, all these and many other phases of medicine may be appreciated by a thoughtful and sympathetic layman when he sees them exemplified in the niceties of superior medical attention but it is too much to expect the lay mind to grasp their significance for remedial care and even more when they are used for preventive care. When we are dealing with tuberculosis and venereal disease in student health activities, we are bound to encounter difficulties which at times may lead to conflict in viewpoints between the student health service and the school administrator. Sometimes these become so acute that the guidance officer is confused, to the great detriment of the student. I know that in dealing with venereal disease specially, school officials find the physicians law of secrecy particularly objectionable.

These and many other difficulties which may be pointed out will find a more easy solution if the institution can develop the attitude that it is the *conclusion* of the student health director rather than the details of information which he has amassed and upon which his conclusions are based, that should be the contribution which the student health director makes to the guidance program. For example, to give to a guidance director such details concerning a chest plate as would be written, for example, by the radiologist, would, I think, be thoroughly misleading to the guidance official even though he wanted the report for his files and insisted on having it. But if the guidance director has learned to have confidence in the conclusions of the student health director, he will accept the decision that this student's health is improving and that, therefore, as far as the student health's findings are concerned, he might be allowed to carry a quarter or a third-time program during a particular semester. I can find no justification in my thinking for a custom that is none too rare of filing student health records where they are accessible to others than the student health physicians. I would even go farther and suggest that except under most unusual circumstances, administrative officers, even confidential officials of a school, should not ask to see student records even though they want the judgment of the student health physician on a particular student problem. I should like to see the student health officer sit in counsel with other guidance officials and administrators when student matters are discussed so that the viewpoint of the student health service might be properly evaluated and correlated with the viewpoints of other university officials.

Numerous other problems arise with reference to the responsibility, the individuation and the adequacy of the student health service. Many of these may involve technical phases of the service, but others arise definitely from the personal character of the student health service. In all of these matters sincerity must, of course, be postulated. I would, however, lay down as a fundamental thesis that in solving these difficulties in individual cases, the most scrupulous adherence to fundamental concepts in medical ethics will finally prove most effective in making the student health service that in-

fluent factor in university life which is most expressive of the highest idealism. When the first compromise is made by the physician with reference to his ethical relationships, his own practice as well as his own effectiveness are threatened. I am fully aware of the fact and have been repeatedly confronted with situations in which urgent pleas were made to unbend on fundamental matters, but in the last analysis the maintenance of these ethical relations are the best safeguard to society and, therefore, also of the university's interest in the student health service. If the university cannot show to the student health official that confidence which is implied in all that I have said, the remedy should be not to force the student health physician to submit his detailed findings to the administrative and guidance officials no matter how capable they be in other fields, but the remedy should lie in getting a doctor towards whom the university can manifest this attitude of trust and confidence.

V. Complications

It might seem as if in this discussion we have completely overlooked the realities of the situation and one of the most real of the realities of the situation is the long series of complications which develop when one attempts to think about the ethical relationships of the student health service itself, particularly with reference to organized medicine. We may briefly touch upon some of these just by way of indicating that all is not well as yet with our student health services and that the very foundations and basic concepts of a student health service have been called into question no matter how ideally gratifying and effective such a service might be in an educational organization. First of all, let us remember that to my way of thinking, it is fundamental that an university or a college must maintain the best possible relationships with organized medicine not because primarily it is organized medicine nor because it is a particular organization, such as the American Medical Association, nor because it is a powerful organization but because through organization, medicine has thrown around itself against its own threatened selfishness and over-individuation and irresponsibility and inadequacy, the only effective social safeguard which could be devised within a profession as elevated and essentially unselfish and by a necessary consequence as deeply debasable and on the part of its least worthy members, as completely selfish as medicine is. If the medical men of the country were not organized as they are, if there were only local organizations or if there were no organizations, the exploitation, the quackery, the debauchery of medical practice, teaching would necessarily be indescribable and the result would be not only a devolution of medicine but a devolution of human society. That is the fundamental reason for organization. Even despite organization and the safeguards thrown around the self-aggrandizement of individual members of the profession, the situation at times becomes bad enough. Surely, if organization of medicine can effect this, every university and college in the land would be ready to endorse such an organization. Those that do not, might quarrel with

the condition of this sentence, they cannot quarrel with its conclusion.

It is my firm belief based upon considerable experience in dealing with the issues involved that a student health service in an university need not contravene the accepted principles of conduct or organized medicine. I do not deny that here and there in a local situation conflicts which may arise between a college's or a university's student health service and the local medical society; nor do I deny that there have been student health services organized which have fallen short of the accepted practices of organized medicine; nor do I deny that in some local conflicts other less worthy considerations than the good of the community, the good of the students, or the good of local society have been dominant. All of these admissions I am prepared to make on the basis of submitted evidence, my contention however, is rather, first of all, that student health services *can* be organized which will conform to the ethical pattern laid down by our recognized and generally accepted medical associations and secondly, that if the student health service is thus organized, it will thus better subserve the principles of the university or college itself and at the same time take into effective account the good of the community within which the college or the university is located. After all, there are relatively few principles in this matter which organized medicine is asking the colleges and universities to safeguard. Freedom in the choice of physician, the personal relationship between the patient and the physician, the corporate practice of medicine, the avoidance of depriving the local profession of their rightful field in securing a livelihood—these fundamentals are from many points of view simple enough, though I am frank to admit, that in specific cases they involve very serious complexities. Much conflict can be avoided by simply recognizing the fact that for the most part some of the chief benefits of the student health service can best be achieved by recognizing the student health service as an investigative, a fact-finding, a diagnostic agency in which the medical curative function occupies relatively a second place and that too a place which can in many localities, be easily transferred to the local profession.

Fee relationships also enter very largely into this question but here again, it would seem that the pronouncement of the Judicial Council of the American Medical Association of approximately a year ago defining the conditions under which contract practice is essentially vicious, is liberal enough to facilitate the development of a wide range of organizational and administrative patterns. And finally, as for the corporate practice of medicine, it would seem that into the organization of the student health service itself, safeguards can be introduced which will maintain the personal relationship of patient and physician, the fundamental rights to secrecy, the personal responsibility of the physician rather than its transfer to a large and, therefore, diffusely responsible corporation. I admit that the solution of some of these problems demands some compromise but be it noted that the compromise is not with reference to a fundamental principle which must at all costs be safeguarded but it is with reference to an individual physician's or an individual university's concept of what they want their student health service to be. It would seem that in this case also, the general good must prevail over the particular good of any individual or agency. Redress, if there must be redress, should come through those adaptations and through that mutual forbearance which society has provided for adjusting mutual rights in temporary conflict.

Finally, we will all agree that the student health service has become an indispensable element in educational organization and administration; that it has become a powerful safeguard of the student's welfare; that it has become an effective instrument in the hands of the faculty in its attitude towards the student body; that it has become a strong and at the same time, a most salutary influence in human society by the insistence which it has taught society to place upon the value of the individual. Its idealism in concept is of the highest order. May it not fail in achieving that great good for human betterment which its general plan leads us to expect of it. It can and should become the expression of that fundamental ambition of each educator to make his students not only more learned but also happier and ethically better members of human society.

Book Notices

FOR THE GYNECOLOGICAL NURSE

Obstetric and Gynecologic Nursing, by FREDERICK H. FALLS, M.S., M.D., F.A.C.S., and JANE R. McLAUGHLIN, B.A., R.N.; 1st edition, green cloth, gold-stamped, 471 pages, 83 illustrations by CHARLOTTE S. HOLT, glossary and index; Saint Louis: The C. V. Mosby Company; 1937. Price, \$3.00.

There is actually a need for this book, which cannot be said of every nursing text. How many obstetric texts can the obstetrician name that were written for nurses? The answer will be "Few, indeed!" This is the only one extant combining gynecologic and obstetrical nursing; and it is complete and sound. The index could have been improved. Dr. FALLS is professor of obstetrics and gynecology in the University of Illinois Col-

lege of Medicine; Nurse McLAUGHLIN is supervisor of the department of obstetrics and gynecology in the Research and Educational Hospital of that college.

THE NURSE ON ORTHOPEDIC CASES

Crippled Children and Orthopedic Nursing, by EARL D. McBRIDE, B.S., M.D., F.A.C.S., and WINIFRED R. SINK, A.B., R.N.; 2nd edition, green cloth, 359 pages plus appendix and index, 195 illustrations; Saint Louis: The C. V. Mosby Company; 1937. Price, \$3.50.

The unusual characteristic of this book is that it could be read and understood by every one from mother, social worker, nurse, to experienced orthopedist. The illustrations are very good; and the authors have done a good job of selection. The appendix is valuable. Dr. McBRIDE is assistant professor of orthopedic surgery in the University of Oklahoma School of Medicine; Miss SINK is educational director of Grace Hospital School of Nursing in Detroit.

NEW TEXT ON SURGICAL NURSING

A Textbook of Surgical Nursing, by HENRY S. BROOKES, Jr., M.D.; 1st edition, green cloth, gold-stamped, 607 pages plus glossary & index, 233 illustrations; Saint Louis: The C. V. Mosby Company: 1937. Price, \$3.50.

The author is instructor in clinical surgery in the Washington University School of Medicine in Saint Louis; and is known for his special studies in gynecological anesthesia and surgery. It is certain, then, that any text to come from his pen would be of great practical benefit to nurses whose duties relegate them to surgical cases. The technics given herein are those used at the Barnes Hospital in Saint Louis. Dr. BROOKES has concern for the surgical nurse, and it is easy to follow this solicitude throughout the volume, particularly in the abundance of well-chosen illustrations. This volume, selling at a modest price, would be very valuable indeed to any surgical nurse.

TWO HANDY SYNOPSES

Synopsis of Gynecology, Based on the Textbook "Diseases of Women", by HARRY STURGEON CROSSEN, M.D., F.A.C.S., and ROBERT JAMES CROSSEN, M.D.; 2nd edition, green fabrikoid, gold-stamped, 239 pages plus index, no bibliography, 106 figures; Saint Louis: The C. V. Mosby Company: 1937. Price, \$3.00.

Synopsis of Genito-Urinary Diseases, by AUSTIN I. DODSON, M.D., F.A.C.S.; 2nd edition, green fabrikoid, gold-stamped, 284 pages plus index, 112 figures, no bibliography; Saint Louis: The C. V. Mosby Company: 1937. Price, \$3.00.

The value of these two synopses is at once apparent to the specialist in the field treated. The first, by CROSSEN and CROSSEN, is based upon that excellent text, *Diseases of Women*. The CROSSENS, by the way, have a new (fifth) edition of their *Operative Gynecology* out this year. The present *Synopsis* shows judicious selection, with good choice of illustrations. The volume by DODSON, who is professor of genito-urinary surgery in the Medical College of Virginia at Richmond, is altered over the first edition to include regulation of infection and calculus formation by diet, and a good section on recent advances in treating cryptorchidism. Both volumes can be recommended as valuable to the medical student, and handy for the established practitioner.

SECOND EDITION OF KEY & CONWELL

The Management of Fractures, Dislocations and Sprains, by JOHN ALBERT KEY, B.S., M.D., and H. EARLE CONWELL, M.D., F.A.C.S.; 2nd edition, red cloth, gold-stamped, 1,222 pages, 1,222 figures, index, references; St. Louis: The C. V. Mosby Company: 1937. Price, \$12.50.

This is not an original work; it probably would not be so good as it is had it been entirely the results of the experience of Doctors KEY and CONWELL. It is freely admitted by the authors that they have taken the methods and procedures of other orthopedists, used them when they have seemed good, discarded them when they were not. The authors believe that fractures ought to have skilled and specialized attention; but they also believe that in a day of increasing industrial and automobile accidents, the general man should be able to recognize fractures and the dangers due to deformities and complications. The illustrations are sharp and clear, and the volume is impressive.

HERTZLER ON ANESTHESIA

The Technic of Local Anesthesia, by ARTHUR E. HERTZLER, A.M., M.D., Ph.D., LL.D., F.A.C.S.; 6th edition, red cloth, gold-stamped, 277 pages plus index, no bibliography, 142 illustrations; St. Louis: The C. V. Mosby Company: 1937. Price, \$5.00.

This 6th edition of a well-known work is interesting. Dr. HERTZLER has not forsaken his premise that minimum amounts

of solutions should be used; that infiltrative anesthesia is better than regional block anesthesia in the interests of exact anatomic operating; and several other considerations. The book is very carefully done; it is accurate and thorough, being preferable to several similar texts which appeared in 1937. The author is professor of surgery in the University of Kansas Medical School, and surgeon to the Halstead Hospital in Halstead, Kansas, where he resides.

A DIAGNOSTIC TEXT

Physical Diagnosis, by DON C. SUTTON, M.D., 1st edition, cloth, 495 pages, index, 298 illustrations and 8 color plates; St. Louis: The C. V. Mosby Company: 1937. Price, \$5.00.

The quadrigemini of physical diagnosis—inspection, palpation, percussion, auscultation—blossom forth in full flower in but one region of the body, the chest. Small wonder, then, that most texts of physical diagnosis hurry through the appendicular, abdominal and capital regions in order to revel among the physical signs of thoracic disease. SUTTON's text is no exception to the rule. Of 500 pages, 250 are devoted to the heart and lungs. Pneumothorax, consolidation of the lungs, pleural fluid, lung cavities, are adequately discussed. The differential diagnoses among these are given in the best textbook style. The characteristic findings in the various valvular lesions of the heart are mentioned.

The unique feature of this text is the series of a score of remarkable photographs of sagittal and transverse sections through the normal chest. These are full-page retouched illustrations, beautifully delineating the anatomy and relationship of the heart and great vessels. These pictures merit hours of study and give the student an intimate topographic appreciation of the mediastinal viscera easily gained in no other way. These illustrations are a contribution to the art of teaching chest diagnosis.

THE ADRENALS

The Adrenals, by ARTHUR GROLLMAN, Ph.D., M.D., 1st edition, 410 pages with index, 11 illustrations, bibliography with 704 references; Baltimore, Maryland: The Williams & Wilkins Company: 1936. Price, \$5.00.

Dr. GROLLMAN, who is associate professor of pharmacology and experimental therapeutics in the Johns Hopkins University School of Medicine in Baltimore, Maryland, has achieved a well-written, thorough treatise, which he has split up into four parts. He discusses the anatomical, physiological, pharmacological, and clinical aspects of the adrenals. Parts two and three are for separate consideration of the medulla and the cortex. The volume is particularly valuable because its author has included the essential facts of no less than 704 references pertaining to the observations of research on the adrenals; in itself a rather ambitious task. Professor GROLLMAN has done it well.

1937 YEAR BOOK OF GENERAL MEDICINE

The Year Book of General Medicine, 1937, edited by GEORGE F. DICK, M.D., LAWRASON BROWN, M.D., GEORGE R. MINOT, M.D., WILLIAM B. CASTLE, M.D., WILLIAM D. STROUD, M.D., and GEORGE B. EUSTERMANN, M.D.; 1st edition, red cloth, stamped in gold, 803 pages plus indices, illustrated; Chicago: The Year Book Publishers, Inc.: 1937. Price, \$3.00.

Again the *Year Book of General Medicine* is first to inaugurate the series of these very useful little compendiums. This one is well-edited, with excellent selections, and good illustrations. It will be noticed that the editors have selected Dr. J. W. WILCE's "Modern Conceptions of Athletic Heart," which appeared in the November 1936 issue of *THE JOURNAL-LANCET*, and Dr. E. G. WAKEFIELD's "Physiology of the Colon," which was published in the December 1936 issue of *THE JOURNAL-LANCET*. These year books are recommended for all physicians.

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MINNEAPOLIS, MINN., MARCH, 1938

A GREAT ADVANCE

The leading editorial in the January 15, 1938, number of the *Journal of the American Medical Association* and the resolution of the trustees is an event of utmost importance to all medical practitioners. It marks a definite turning-point in medical practice and has the capacity for far-reaching changes in the practice of medicine. This definitely places on local and state societies the care of indigent and low income groups—the solution of the problem of medical care in its entirety. The responsibility for workable plans of medical care is squarely on the shoulders of organized medicine and failure of organized medicine to solve these existing difficulties can only mean one thing: "state medicine" in all of its worst form.

Each society may now proceed with an analysis of its situation; from this analysis set up fundamental facts covering medical practice, social and economic conditions and from these fundamentals attempt the structure of plans to fit the existing conditions. It is to be assumed that no plan or plans will ideally or practically answer all needs but will be an initiated measure for discussion, revision and final practical application. It would seem highly advisable that all plans be submitted to the state committee on economics so that definite policies could be established and concrete plans for operation would be uniform.

It is quite evident that very varied conditions exist in the state; some communities can be well taken care of by their local societies and others must devise plans to give the practitioner a living wage at least, in order that adequate medical care of persons may be given, thus not permitting the necessity of governmental agencies supplying this care. It is quite obvious that no one policy or plan can fit the needs in all parts of the state. It is also obvious that the proponents of one plan cannot hope to have their plan adopted without vitally injuring practitioners in regions where their plan is not applicable.

This subject demands not only for ourselves, but for our successors, the most serious consideration and careful impartial analysis, fully thought-out plans, thoroughly discussed and thoughts allowed to mature. Hasty decisions may initiate measures of untold harm and forever uncorrectable; on the other hand, plans based on sound principles and fundamentals have the potentialities of a leading light in medical practice for years to come.

In discussing these plans, the subject should be rigidly adhered to—only two exhibits are on display—one the medical care of the patient always foremost in the mind of the medical practitioner, and the other the welfare of the practitioner who has made American medicine the envy of the world.

T. L. H.

THIRD-YEAR NEGLIGENCE IN SYPHILIS

A deplorable thing about syphilis is that while it is a curable disease, there are so many cases never cured. We have statistics of its prevalence but nothing tangible about complete recoveries. Three years is a long time to carry on treatment, and every physician knows how indifferent the patient becomes during this period in the absence of physical discomfort. To be sure, we find the afflicted more willing to submit to adequate treatment now that we have the Wassermann test; but the patient often places too much assurance upon the first negative report and fails to return for further observation after his rest period. The false security experienced from this first negative is to blame for many cases of resultant neglect and incomplete treatment. We should have a better control over patients subsequent to treatment. This can only be had by some form of compulsory examination over a period of years.

A. E. H.

BACTERIAL ENDOCARDITIS

Bacterial endocarditis, acute and subacute, furnishes us with a rather common and usually fatal disease entity, where the futility of present therapy challenges science to renewed investigation. Previously damaged or congenitally malformed valves (with certain exceptions for gonococci and pneumococci) become the nidus upon which stick bacteria floating in the circulation. Any accident or infection spilling organisms in any amount into the circulation invites disaster for the patient. Nedzel¹ has reported upon a method which involves the use of pitressin (creating "pressor episodes") and has published convincing photomicrographs illustrating the resultant edema of the valvular endocardium in dogs. Upon this base, injected staphylococci lodge in great numbers, followed by the deposition of fibrin. Powdered and suspended coal injected, deposited in the same manner.

Mills², of Cincinnati, at the recent meeting of the Central Society for Clinical Research, reviewed atmospheric, climatic and housing conditions in terms of the incidence of rheumatic infections—by far the most common agency for primary valve damage. This rather widely-accepted connection lends interest if not conviction to the theme of Petersen's book, *The Patient and the Weather*.

If we proceed from this seasonal incidence (which may be one phase of a "conditioning") to the further factors leading to valvular vegetations and a mechanical death largely from systemic embolic implantations (kidney, spleen, brain, marrow, subcuticular, subconjunctival) we become impressed with certain facts:

(1) No organism is specific for the sequence, despite the very great preponderance of streptococcus viridans. Reports upon new organisms involved appear almost as soon as clinical interest uncovers their incidence. (*B. militensis*, for example).

(2) The very common failure to secure positive blood cultures where the clinician knows subacute bac-

terial endocarditis is present, is now known to be due to the high lytic powers of the patient's sera and not to faulty laboratory technique. Keefer⁴ has recently reviewed this phase of the subject with the greatest of clarity, emphasizing the importance of (a) previously damaged valves; (b) platelet thrombi deposited thereupon; (c) transient bacteraemia with antibodies which encourage localization of the bacteria.

This should lead us away from the hope of stopping the disease by further treatment by any vaccine or serum that might only exaggerate a bodily defense that is constitutionally adequate (endocarditis lenta) but locally devastating (embolic death); or from the notion that some drug (sulfanilamide has been tried, of course, and slight evidence for its value presented) found which by killing the organism or checking its growth might save the patient.

Keefer refers to Wadsworth's⁵ observation made in 1919. This observer had seen in horses made immune to pneumococci, bacterial endocarditis. This came not *early*, when immunization was started, but *late*, after a high antibody titer had been established in the horses' circulating blood. Furthermore, these horses had negative blood cultures, even as do many humans in "bacteria-free phases."

I write this at a time when the newspapers have suddenly discovered "subacute bacterial endocarditis," and have started upon a noisy hunt for "healed cases" from which to transfuse some unhappy subject. Louis Hamman doubts whether there are as many such recovered subjects as Libman intimates exist! The point is that the whole gesture sounds futile anyway. Keefer's article further builds up the thesis of unhappy mechanical localization by quoting from Hamman & Rienhoff a full-blown streptococcal viridans septicemia which arose from an external iliac artery (arteriovenous aneurysm) where excision cured the entire disease! I have seen the full picture of "bacterial endocarditis" when the autopsy showed the shelving "ulcerating" areas in some area of the aorta or its major branches, from whence fibrin plugs were wafted to embolic lodgement.

We arrive, therefore, at the major factor of local damage, platelet and fibrin deposit, and the piling-up of debris, which many recent observers associate with a shielding of the bacteria implanted, and sequestered both from the patient's serum and phagocytic leucocytes. Indeed, so perfect is this protection that specimens in formalin, pickled for months, have yielded positive culture when the depths of the deposits are exposed and cultured! This process is certainly not far removed from the sequences involved in thrombophlebitis. Recently word has come from Toronto that a renewed attempt with "heparin" has been made by surgeons to reduce the postoperative calamities associated with vicarious clotting in the veins. From New Orleans, Ochsner re-acclaims the value of leeches (hirudin) applied along the venous channel involved. One wonders if the local effect on congestion is not greatly less than the systemic effect on thrombin behavior. If we could be sure of our diagnosis of subacute bacterial endocarditis quite

early, and had in mind the dangers of hypersensitivity and precipitant thrombotic emplacement, perhaps some of these inhibitors to clotting would enable some doomed subjects to overcome the infection in an open and fair fight.

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E. L. T.

FEDERAL FUNDS FOR HOME OWNERS' LOAN CORPORATION EMPLOYEES

The medical profession has of late been concerned about the Federal plans to furnish group medical care to the employees of the Home Owners' Loan Corporation in and near Washington. This care may be extended to serve those in Federal civil service positions. Several days ago, the acting comptroller-general ruled that the Home Owners' Loan Corporation was without legal authority in lending the money designated in his document. It has been intimated, however, that the decision was based upon a technicality, and that it would not directly affect adversely the present plan for the socialization of medicine. United States Senator Pat McCarran, of Nevada, who asked for the ruling, urges specific legislation on departmental expenditures.

Now, the public relations bureau of the Medical Society of the State of New York has a well-organized plan for the distribution, through its component medical units, and newspapers and magazines, of material for the public. The latest is a well-balanced article taken from *The Sign*, a Roman Catholic monthly publication, for the issue of January, 1938. This piece deals with socialized medicine *via* the national government for the public *en masse*. A few pertinent paragraphs therein read as follows:

"From observation, the writer [Joseph F. Thorning] knows that much of the material prepared by the Child Welfare Bureau is repetitious, commonplace, and distinguished by length rather than clarity. One wonders what proportion of it has been prepared by mothers who have had the actual experience of raising a family. To be sure, its preparation calls for a large number of editorial assistants and so-called feature writers. Their principal employment seems to be acting as publicity directors for the bureaus in question. And each year their chiefs demand larger Federal appropriations, a practice that leads to additional names on the payroll, and an increased tax burden for the average citizen.

"Although the voluntary committee (referring to the recent committee of about 430 physicians who suggested drastic changes in the method of medical practice, and demanded that the American Medical Association sug-

gest some suitable changes, *etc.*) recommends that the expense for the increased public activity in health services be met by proportionate contributions from local, state, and Federal governments, *we know perfectly well that the states and local communities that are now shirking their proper share of relief burdens are not at all interested in anything but dumping their responsibility for the medically indigent upon the door-step of the Washington government.* If we are to have Federal control of medicine, we may as well be frank about its implications.

"... Governmental control of the hospitals would be even more serious

"To deny the reality of this danger, one must adopt the naive assumption that there is one department or bureau in Washington that is exempt from the influence of big time or small time politicians."

It is very interesting to notice that lately the American Medical Association and its constituents have taken on an unasked-for ally—this new bedfellow being the former dissident Christian Science group. It is of course plain that while heretofore the Scientists have been fairly well able to get along with the medicos, this newly-created plan for the national government to handle all medical affairs suggests to this new bedfellow that possibly there might be some very vigorous efforts to bring all persons and all cults under some form of Federal regimentation. "Mass medicine" might affect even the anti-vivisectionists! There is a recently-published article in a Christian Science organ which quotes one Doctor Hutchinson of London, England, concerning the subject of the British national medical practice, including health insurance, *etc.* Attention is called to the dangers of excessive drugging, the creation of hypochondriacs, malingerers, and lastly, Doctor Hutchinson is quoted thus:

"That great advances will be made we feel tolerably sure, although the popular opinion that for every disease there is a medical cure, if only we could find it, is certainly a delusion; but whence new help will come, it is impossible to say; it may well be from outside of medicine and its ancillary sciences."

A. W. S.

CASE REPORT

SAFETY PIN IN THE ESOPHAGUS, OPEN END FOREMOST

Virgil J. Schwartz, M.D.
Minneapolis, Minnesota

Among the various types of foreign bodies which find their way into the esophagus, open safety pins are fairly common. In almost every instance the pin has been swallowed with the looped end foremost, since such a position facilitates travel in the direction of this end. Any force, however, which draws or propels the pin in the opposite direction, that is, toward the mouth, is apt to cause perforation of the esophageal wall *unless the point is sheathed or otherwise covered.* If, then, the open end is nearest the operator, the pin may either be closed by special forceps, or the pointed end may be brought into view by gentle manipulation of the endoscopic tube, freeing the point from the esophageal mucosa if necessary. The sharp end is then drawn into the lumen of the tube, after which the pin

Societies

SCIENTIFIC PROGRAM OF THE MINNEAPOLIS CLINICAL CLUB

Meeting of December 9, 1937.

D. D. Turnacli, M.D., Presiding

PRIMARY TUBERCULOSIS OF THE SKIN*

Abstract of Inaugural Thesis of

Carl W. Laymon, M.D.

Minneapolis

The primary complex of tuberculosis of the skin consists of an ulcer at the point of inoculation of the tubercle bacilli, with an accompanying regional lymphadenitis. The cutaneous primary complex represents the reaction which occurs when tubercle bacilli are implanted in the skin for the first time, and is comparable to the Ghon tubercle and affected regional nodes in the lung. Such cutaneous infections are rare, and since most primary reactions occur internally (lungs or gastrointestinal tract), the skin as a portal of entry for the tubercle bacillus has been largely overlooked. Two cases were reported, and the clinical and histologic features, therapy and prognosis of the cutaneous primary complex were discussed. Case Two was noteworthy because of its three primary lesions appearing in each instance after trauma.

* To be published in full in an early issue of THE JOURNAL-LANCET.

AN UNUSUAL TUMOR COMPLICATING PREGNANCY

C. J. EHRENBERG, M.D.

MINNEAPOLIS

This report was listed as "An Unusual Tumor Complicating Pregnancy," which it undoubtedly was, but the first interest to me was that it complicated labor. Also, I owe an apology as the case has not yet come to a final conclusion. The woman still has her tumor.

I saw the patient in consultation in the late evening of September 9th. The patient was 23 years old, a primipara. Her last menstrual period was November 16, 1936, making the estimated confinement on August 26th. Past history was essentially negative except that she had had a psoriasis all her life. Menstrual history was normal; began at the age of 12, flowing 4 days at 28-day intervals. She had gained 65 pounds during her pregnancy, 7 pounds of which were gained in the last week. On September 2nd she was brought into the hospital because she had not gone into labor. X-ray was taken, baby was in normal O. L. A. position with the head high above the brim of the pelvis which was adequate in contour and diameters. The same day an attempt at induction of labor was made with castor oil, quinine, and thymophysin which failed. The patient was allowed to go home the next morning. She returned to the hospital the morning of September 7th and a bag induction was tried but the cervix could not be found. After some manipulation the attempt was stopped. She remained in the hospital and on the morning of the 8th a second attempt at induction was made with castor oil, quinine, and thymophysin. Medication was completed by noon and at 1:30 p. m., the bag of waters ruptured spontaneously. Pains began slowly and continued all through the night and the next day, which was the 9th. The only sedative had been 3 grains of nembutal in the morning of the 9th and $\frac{1}{4}$ grain morphine in the evening of the 9th.

When seen, the patient was in active labor with pains occurring from 1 to 3 minutes and lasting 30 to 60 seconds. Maternal pulse was 100. The temperature was $99\frac{1}{2}^{\circ}$ and some degree of dehydration was present. Abdominal examination showed the baby in O. L. A., vertex presenting with the head high above the pelvic brim. Foetal heart was normal. In doing a rectal examination a retrorectal tumor was found. The tumor



Figure 1.

The patient is erect. The pin may be seen lying with the open end down and the sharp pin-point to the patient's left. The looped end is uppermost, toward the operator.

is removed at one time with the forceps and esophagoscope. Another procedure is sometimes possible: When the pin is small and the esophageal lumen is of ample size, a version may be done so as to change the position of the pin from that of open end up to one of open end down. Occasionally, the pin may be cut near the looped end by means of long, tough cutting forceps, after which it is removed in two sections.

It is conceivable, though rare, that the pin may be lodged with the open end foremost; in such a case pushing the pin toward the stomach is apt to be fatal, again because of the danger of perforation of the esophageal wall with subsequent mediastinitis. Sometimes the pin lies fairly high—in the hypopharynx or in the entrance to the esophagus. Misguided efforts to remove this pin with the finger, blindly, may force the point of the pin through the esophageal wall. On the contrary, through the esophagoscope the pin can be seen and removed with comparative ease in this position.



Figure 2.

The extracted safety pin. This demonstrates the extent to which the pin was deformed.

B. D., aged 12, was admitted January 30, 1938, with a history of having swallowed an open safety pin a few hours before. A roentgen plate of the neck and chest was taken and it was surprising to find that the pin was incarcerated with the open end foremost. This would probably not have happened if it had not been for the fact that the pin was rather small as compared with the lumen of the esophagus. As has been stated, the problem of removal is comparatively simple when the looped end is nearest the operator. True, it is necessary to approach the pin with caution so that the pointed end is not driven into the esophageal wall, but the extraction should not be difficult.

In the present instance the pin was quickly removed and the child made an uneventful recovery.

seemed to arise from the front and left side of the sacrum, pushing the rectum and vagina anteriorly and somewhat to the right. It was about 3 inches in diameter, obstructing the vagina almost completely, the lower margin was $1\frac{1}{2}$ inches above the anal margin and the upper limit was indefinite. The consistency of the tumor could be described as tensely fluctuating or doughy. It was immobile and was not tender to palpation. By pushing the examining finger to the right and anterior it could be introduced past the tumor sufficiently to feel the part of the presenting part in the right of the pelvis. This was identified as the head. A small part of the rim of the cervix, which was estimated to be dilated 8 cm. with complete effacement, could be made out.

With the tumor most probably being a cyst, a consideration of the patient's condition generally, the estimated degree of dilatation and effacement, the recent previous vaginal manipulation and the adequate pelvic diameters, made delivery from below seem desirable if not imperative.

Consequently, under nitrous oxide anesthesia a long needle attached to a syringe was introduced through the skin just lateral to the left side of the anus. With a finger in the rectum as a guide, the needle point was inserted into the tumor mass. Aspiration was a failure but on withdrawing the needle it was found to be filled with sebaceous-appearing material. A second attempt at aspiration was made employing a larger needle with the same result. An incision was then made at the site of entry of the needle and the point of a blunt scissors inserted. Again using the finger in the rectum as a guide, the scissors was pushed into the mass. The opening was enlarged by widely spreading the scissors on withdrawal. This was followed immediately by a discharge of sebaceous-appearing material of about the consistency of cottage cheese. It had no odor. About one pint of the material was expressed through the incision by the rectal finger. The tumor outline could then be followed to a level as high as the left sacro-iliac joint with the rectal examining finger.

The patient was allowed to go on with labor under gas analgesia. The foetal head progressed down the birth canal without difficulty, bulging the pelvic floor in about 2½ hours. During this part of the labor it was interesting to watch the sebaceous material emit from the incision, in long ribbons from 2 to 10 inches long and about $\frac{1}{2}$ inch in diameter, with each pain. Most of the sebaceous material was collected and it measured over one quart in amount. A living baby was delivered with outlet forceps through a moderate-sized right post-lateral episiotomy. Immediately following the delivery and the episiotomy repair 20 cc. of lipiodol was injected into the cyst cavity and an attempt made to outline the borders by the use of X-ray. The picture was unsatisfactory as the patient was too ill to permit transfer to the X-ray room and the portable X-ray unit proved to be inadequate.

The sebaceous material was found to contain squamous epithelium cells and cholesterolin crystals which, according to the pathologist, indicates that the tumor was of a dermoid nature.

The puerperium was complicated by the tumor cavity's becoming infected. This proved to be a mixed infection containing streptococcus, pneumococcus and colon bacillus. Constitutional therapy, sulfanilamide, and rubber tube drainage were used as treatment. The patient left the hospital with her baby in four weeks.

At the present time the sinus drains intermittently, although the patient's temperature remains at about normal. There is some evidence of sinus formation between the rectum and the tumor cavity, but a definite study has not been made as yet. The tumor mass is also present in about the same proportions. The uterus has returned to normal size and is pushed well to the right and up in the pelvis, the cervix being directed downward and forward, toward the pubic arch.

This case is of interest from the obstetrical standpoint because of the unusual location of the obstruction. From the gynecological and pathological standpoint it is probably of even greater interest. If the tumor is a dermoid cyst, from what structure does it arise? This may be answered when the patient is sufficiently recovered to permit removal of the tumor.

Discussion

Dr. J. S. McCARTNEY: Dr. Ehrenberg and I have discussed this at various times and we have not been able to figure out where this thing came from unless it arose locally.

Note: The tumor was removed on Jan. 12, 1938, by Dr. Martin Nordland. It proved to be an extraperitoneal epidermoid cyst within the pelvis. The patient has made an uneventful recovery.

L. R. BOIES, M.D., Secretary.

Organization Meetings

MONTANA HOUSE OF DELEGATES TO CONVENE

The House of Delegates of the Medical Association of Montana will convene at Livingston on April 26, 1938, according to official notice.

ANNOUNCEMENT

The Mid-West Sectional Meeting of the American College of Surgeons, including the states of Wisconsin, Minnesota, Iowa, Illinois, and Upper Michigan, will be held in Milwaukee, Wisconsin, on March 29, 30, and 31. The headquarters will be at the Schroeder Hotel. A most active Committee on Local Arrangements, headed by Dr. Carl W. Eberbach, is making excellent plans for this meeting. There will be an exceptionally interesting program consisting of clinics, scientific sessions, hospital conferences, medical motion pictures, and other features during the meeting. A visiting group of ten or twelve outstanding surgeons will be present to participate in this program.

A general outline of the program is as follows:

Tuesday, March 29

- 8:00—9:00 Registration and general information for Fellows of the College, hospital representatives, and guests.
- 8:00—9:00 Inspection of technical and scientific exhibits.
- 9:00—12:00 Operative and non-operative clinics, surgery and the surgical specialties, local hospitals.
- 10:00—12:00 Hospital conference.
- 12:00—2:00 Inspection of technical and scientific exhibits.
- 2:00—4:30 Hospital conference.
- 2:30—4:30 Medical motion pictures:
 1. General surgery.
 2. Eye, ear, nose and throat surgery.
- 4:30—5:00 Annual meeting, Fellows of the College.
- 5:00—6:00 Inspection of technical and scientific exhibits.
- 6:30—8:00 Dinner.
- 8:00—10:00 Scientific meeting, general surgery.
- 8:00—10:00 Medical motion pictures, eye, ear, nose and throat surgery.
- 8:00—10:00 Hospital conference.

Wednesday, March 30

- 8:00—9:00 Registration and general information for Fellows of the College, hospital representatives, and guests.

- 8:00—9:00 Inspection of technical and scientific exhibits.
- 9:00—12:00 Operative and non-operative clinics, surgery and the surgical specialties, local hospitals.
- 9:30—12:00 Hospital conference.
- 12:00—2:00 Inspection of technical and scientific exhibits.
- 1:30—2:30 Medical motion pictures, general surgery.
- 2:00—5:00 Hospital conference.
- 2:00—5:00 Scientific meeting, eye surgery.
- 2:00—5:00 Scientific meeting, ear, nose and throat surgery.
- 2:30—5:00 Scientific meeting, general surgery.
- 5:00—6:00 Inspection of technical and scientific exhibits.
- 6:30—8:00 Medical motion pictures, general surgery.
- 8:00—10:00 Scientific meeting, general surgery.
- 8:00—10:00 Scientific meeting, eye surgery.
- 8:00—10:00 Scientific meeting, ear, nose and throat surgery.
- 8:00—10:00 Motion pictures for hospital personnel.

Thursday, March 31

- 8:00—9:00 Registration and general information for Fellows of the College, hospital representatives, and guests.
- 8:00—9:00 Inspection of technical and scientific exhibits.
- 9:00—12:00 Fracture clinic.
- 9:00—12:00 Operative clinics, eye, ear, nose and throat surgery.
- 9:30—12:00 Hospital conference.
- 12:00—2:00 Inspection of technical and scientific exhibits.
- 1:30—2:30 Medical motion pictures, general surgery.
- 2:00—5:00 Hospital conference.
- 2:00—5:00 Scientific meeting (panel round table conference), eye surgery.
- 2:00—5:00 Scientific meeting (panel round table conference), ear, nose, and throat surgery.
- 2:30—5:30 Cancer clinic.
- 8:00—10:00 Medical motion pictures, general surgery.
- 8:00—10:00 Community health meeting.

This meeting will be of interest not only to Fellows of the College but to the medical profession at large, as well as to hospital trustees, superintendents, nurses, and hospital personnel. Members of the State Medical Association are most cordially invited to attend. There will be no registration fee.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

DOCKET OF CASES

Olivia Chiropractor Pleads Guilty

STATE OF MINNESOTA vs. HANS C. HANSON

On January 29, 1938, Hans C. Hanson, 62 years of age, entered a plea of guilty to an information charging him with practicing healing without a basic science certificate. Hanson's plea of guilty was entered before the Honorable G. E. Qvale,

judge of the District Court, at Willmar. The court, upon being advised that Hanson had closed his office and taken his signs, sentenced the defendant to pay a fine of \$50.00 plus court costs of \$11.00.

The investigation made by the Minnesota State Board of Medical Examiners disclosed that Hanson opened an office at Olivia in October, 1937, for the practice of chiropractic. Hanson has no license to practice any form of healing in the state of Minnesota or elsewhere. He had a diploma on his office wall dated December 5, 1914, from the Palmer School at Davenport, Iowa. He admitted, however, that he had taken only a one-year course to obtain the diploma, and that his preliminary education was limited to the eighth grade. He stated that after his graduation from the Palmer School, he practiced chiropractic for 15 months at Sydney, Montana; and returned to his home at Hutchinson, Minnesota. He also stated that in 1919, when the Minnesota chiropractic law was passed, he was farming. Shortly before opening his office at Olivia, Hanson stated that he took a one-month postgraduate course at the National College of Chiropractic, in Chicago. Hanson used no pretext about practicing, having the chiropractic sign on his door and also one on the outside of the building where he was located. He also ran a card in the *Olivia Times*.

The Medical Board wishes to acknowledge the fine cooperation from Mr. Russell L. Frazee, county attorney of Renville County.

News Items

The Mayo Clinic announces for the benefit of Northwest physicians that a special program of lectures and demonstrations in medicine and surgery will be held in Rochester from March 28 to April 1, inclusive. Symposia on gastric diseases, diseases of children, cardiology, urology and back-ache, and conferences on roentgen, radium and physical therapy will be included.

Students who enter the University of South Dakota Medical School in September 1938 may at the conclusion of their two-year course enter any senior medical school in the United States, according to the Council on Medical Education and Hospitals of the American Medical Association, according to Dr. E. A. Pittinger, Aberdeen, president of the South Dakota State Medical Association.

The Fifth District Medical Society of South Dakota has elected Dr. Lorenzo N. Grosvenor of Huron, as its president. Dr. Merrill W. Pangborn, Miller, is vice president; Dr. B. T. Lenz, Huron, is secretary-treasurer; and Dr. Mark E. Cogswell, Wolsey, and Dr. William H. Griffith, Huron, are the two censors. Dr. Griffith is the society's delegate to the state convention; and Dr. Guy Elmer Burman, Carthage, is councillor.

Dr. William E. G. Lancaster and Dr. Arthur C. Fortney, Fargo; Dr. Clarence V. Bateman, Wahpeton; Dr. Norvel O. Brink, Bismarck; Dr. Reinhold O. Goehl, Grand Forks; Dr. Carl O. Rollie, Drake; and Dr. Aaron Stolinsky, Lisbon; were North Dakota physicians registered for the institute on medical diagnosis and treatment which opened at the University of Minnesota in Minneapolis on February 7, 1938.

Mrs. Augustus Sheridan Kech, Altoona, Pa., president of the Woman's Auxiliary of the American Medical Association, paid an official visit to South Dakota on January 19 and 20, 1938, and was entertained in Sioux Falls by the Woman's Auxiliary to the Seventh District Medical Society. Mrs. J. R. Westaby, Madison, president of the state auxiliary, discussed her work; and Mrs. Kech spoke on the national group's activities. She also spoke before the Sioux Valley Medical Association's annual banquet on January 19 at the Cataract Hotel. January 20 was spent in discussion with the women members.

Dr. Chester A. Stewart, clinical professor of pediatrics in the University of Minnesota Medical School, delivered the Sigma Xi lecture in Northrop Memorial Auditorium, University of Minnesota, on February 11, 1938. He spoke on recent advances in dietary knowledge.

Dr. Emmett A. Doles spoke at Kremlin and Box Elder High Schools in Havre, Montana, on February 10, 1938, concerning Mantoux tests which were given to these school children on February 16 in Havre.

Dr. August C. Orr, director of the division of child hygiene of the North Dakota State Department of Health, spoke in Bismarck on February 7, before a number of Girl Scouts and Brownie leaders.

Dr. H. E. Hilleboe, director of the divisions of tuberculosis and services for crippled children of the Minnesota State Board of Control, addressed the children of the Stillwater High School on February 10, 1938. He discussed "Tuberculosis and the Mantoux Test."

Dr. William A. Brand, Redwood Falls, was reappointed to the Minnesota State Board of Health on January 31, 1938, by Governor Elmer Benson.

The Minnesota Pathological Society met on February 15, 1938, in the Institute of Anatomy, University of Minnesota, to hear "Hormones in Modern Pathology," an address delivered by Dr. Roy G. Hoskins, Boston, research associate in physiology, Harvard Medical School.

The Silver Bow County Medical Society (Montana) met in Butte on February 1, 1938. Dr. A. R. Foss, Missoula, spoke on "Allergy in General Practice" (see *THE JOURNAL-LANCET*, February 1938, p. 60).

The Third District Medical Society of South Dakota met at Brookings on January 21, 1938; with every physician in Lake County in attendance. Dr. Edward B. Tuohy, Rochester, Minn., instructor in anesthesia in the University of Minnesota Graduate School of Medicine, spoke on "Anesthesia."

Dr. Ernest H. G. Rowen, Miles City, is the new president of the Eastern Montana Medical Society as a result of the election and meeting at Terry on January 30, 1938. Dr. Melville George Danskin, Glendive, is the vice-president, and Dr. Stuart A. Olson, Glendive, is the secretary.

Dr. Cyril J. Glaspel, Grafton, was named president of the Grand Forks district of the North Dakota State Medical Association in January. Dr. Olaf H. Muus, Grand Forks, was chosen vice-president; and Dr. Reinhold O. Goehl, Grand Forks, was elected secretary-treasurer.

Dr. William Burchard Roberts is the new president of the staff of Eitel Hospital in Minneapolis. Dr. Edgar W. Bedford is vice-president; and Dr. Wallace I. Nelson is the secretary.

Dr. Richard S. Ahrens, Minneapolis, assistant professor of nervous and mental diseases in the University of Minnesota Medical School, was appointed assistant superintendent of the Minnesota State Hospital atergus Falls on February 1, 1938.

Dr. Leland Guy Russell was elected president of the staff of Saint Vincent's Hospital in Billings, Montana, on January 10, 1938. Dr. Herbert T. Caraway, Billings, is vice-president; and Dr. John E. Hynes, Jr., is the secretary.

Dr. Faris F. Pfister, Webster, was elected president of the Whetstone Valley Medical Society of South Dakota at Sisseton on January 20, 1938. Dr. Frank Neill Cliff, Milbank, is the new vice-president; and Dr. Percy Dickinson Peabody, Jr., Webster, was chosen secretary-treasurer. Talks were given by Dr. Solomon Weiss, of the Kyle District Indian Reservation hospital, and Dr. David A. Gregory, of Milbank.

Dr. Russell R. Hendrickson, Wadena, a graduate of the University of Minnesota Medical School in 1928, has been appointed resident physician of the Minnesota State Reformatory at Saint Cloud. His term began on February 1.

Dr. J. Vincent Sherwood, superintendent of Sanator, the South Dakota tuberculosis hospital, was elected vice-president of the South Dakota Public Health Association at Madison on February 3, 1938. Other officers elected are not physicians.

Dr. Bernard Alexander Mazurowski, Buffalo, N. Y., a graduate of the University of Buffalo School of Medicine in 1926, has associated with Dr. Jacob H. Fjelde in the Black Building, Fargo, N. D.

Dr. B. A. Dyar, assistant superintendent of health for South Dakota, announced on February 3 that Joseph E. Studenberg, Midland, and Herrick John Aldrich, Watertown, have been licensed to practice medicine in South Dakota.

Dr. J. R. Dillard, Fargo, was elected to membership in the Cass County Medical Society (North Dakota) on January 31, 1938.

The city of Helena, Montana, now has a \$100,000 Crippled Children's Hospital, dedicated on January 20, 1938, as a unit of the Montana Children's Home and Hospital. The money for construction was donated by Mr. Louis W. Shodair, long a resident of Montana.

On February 7, approximately 1,500 students in schools of Yellowstone County in Montana were given Mantoux tests by physicians of the Yellowstone County Medical Society, according to Dr. Herbert T. Caraway, secretary. The tests and examinations were conducted from the 7th to the 22nd of the month, by Drs. David S. Harman, Cedric H. Nelson, Caraway, H. O. Drew, John E. Hynes, Leland Guy Russell, and Richard R. Chapple, of Billings; Dr. Earl C. Hall and Dr. Theodore R. Vye, of Laurel; and Dr. Roger W. Appelman and Dr. J. J. DeMeres, of Worden.

Dr. Henry John Borgmeyer, physician to Camp Estes in Deadwood, S. D., was married on February 7, 1938, at Deadwood, and has announced his intention to reside in that city.

"The Trend of Medical Care" was a subject of the Public Forum of Civic Affairs held on February 9, 1938, in the Lewistown Court House in Montana. Dr. Fred Franklin Attix, of the Attix Clinic, was a speaker.

The Aberdeen District Medical Society of South Dakota met at Aberdeen on January 18, 1938. Dr. Geoffrey I. W. Cottam, Sioux Falls, spoke on "Some Common Diseases of the Chest"; and Dr. Owen King, Aberdeen, presented the annual presidential address. The new Drinker respirator supervised by this society was demonstrated at the meeting. Dr. Thomas Pollock Ranney, Aberdeen, was named president; Dr. James Douglas Alway was chosen vice-president, and Dr. Jonathan E. Bruner was elected secretary.

The new Bowbells Community Hospital (North Dakota) was opened for occupancy on March 1st, 1938.

About 100 physicians from all sections of Minnesota gathered at St. Paul on February 26, 1938, for the annual County Officers' Conference of the Minnesota State Medical Association. Many speakers were scheduled, and the meeting was presided over by Dr. J. M. Hayes, Minneapolis, president of the Minnesota State Medical Association; and Dr. A. W. Adson, past president.

Dr. E. Roy Grigg, Bozeman, was elected president of the Montana Academy of Oto-Ophthalmology on February 16, 1938. Dr. Ashley Walker Morse, Butte, was re-elected secretary-treasurer.

The regular bi-monthly meeting of the Black Hills District Medical Society of South Dakota was held in Lead on February 17, 1938. Dr. Paul P. Ewald, Lead, president, was the presiding officer. Dr. Nelson W. Stewart, Lead, Dr. N. Ellis Mattox, Lead; and Dr. J. L. Stewart, Nemo, were on the program.

Dr. Julian F. DuBois, secretary of the Minnesota State Board of Medical Examiners, St. Paul, spoke on "The Basic Science Law of the State of Minnesota" before the annual Congress on Medical Education and Licensure of the American Medical Association at Chicago on February 15, 1938.

Dr. Herbert H. James, of Murray Hospital, Butte, Montana, spoke on "Cancer and Its Treatment" before the Butte Rotary Club on February 16, 1938.

Dr. Clarence E. Sherwood, Madison, Dr. B. A. Dyar and Dr. W. W. Towne, both of Pierre, attended a meeting of the Congress on Medical Education and Licensure in Chicago during February, for the South Dakota State Medical Association.

Dr. Domingo Norberto Monserrate, surgeon at the Fort Harrison Veterans Facility in Montana, was elected to fellowship in the American College of Surgeons at the recent congress in Chicago. Dr. Monserrate was graduated from the Georgetown University School of Medicine in Washington, D. C., in 1929, and has been with the Fort Harrison hospital since February of 1937.

Dr. Martin W. Roan, of the Roan and Strauss Clinic in Bismarck, North Dakota, has returned to practice after a course in fracture treatment at the Johns Hopkins University School of Medicine in Baltimore, Maryland. He attended the recent congress of the American College of Surgeons in Chicago.

Dr. Monte C. Piper, Rochester, assistant professor of medicine in the University of Minnesota Graduate School of Medicine, was elected president of the Olmsted-Houston-Fillmore-Dodge County Medical Society at Rochester on November 3, 1937. Dr. Piper had served as secretary since 1924 of the Olmsted County Medical Society, which merged in 1930 with the present organization.

Dr. Albert Szent-Györgyi, 44, professor of medical chemistry in the Magyard Királyi Ferencz Jozsef Tudományegyetem Orvostudományi Kara, at Szeged, Hungary, has been awarded the 1937 Nobel Prize in chemistry and physiology, for work done largely while he was in residence at the Mayo Clinic, Rochester, Minnesota. Dr. Szent-Györgyi came to Rochester in September, 1929, staying for nine months. He used the fresh adrenal glands of cattle obtained in the St. Paul stockyards.

Assistant Attorney-General T. A. Thompson, of the State of North Dakota, has ruled that a health certificate issued for the marriage of couples must bear the signature of a duly licensed doctor of medicine. The signature of an osteopathic physician does not satisfy Section 4375 of North Dakota Statutes. Attorney-General P. O. Sathre has issued the same ruling in regard to the validity of a chiropractor's signature.

The well-known "Doctor" Max Schneller, who was once convicted in North Dakota of practicing medicine without a license, has encountered more trouble in New York City. Completing an 18-month term for forgery in New York State, Schneller was to have been deported to Germany; but since he claimed that his entry into that country would mean "certain death," the United States Bureau of Immigration is trying to deport him to another country.

Dr. Theodore W. Stransky, a graduate of the University of Minnesota Medical School in 1935, has opened offices in the Greengard Building, Mandan, N. D., for the practice of general medicine and surgery.

The North Dakota State Board of Medical Examiners on January 7, 1938, at Grand Forks, suspended the license of Dr. Joseph Allaire, 54, of Olga, a graduate of the Laval University Faculty of Medicine in Quebec in 1908; and that of Dr. John Morgan Phillips, 70, Bisbee, a graduate of the old Keokuk Medical College in Iowa in 1891. Both physicians were charged with violation of the Medical Practice Act.

The Sixth District Medical Society of North Dakota met on December 14, 1937. The program was devoted to a symposium on venereal diseases. Dr. Frank Darrow of Fargo, Dr. John A. Cowan, Bismarck, and Dr. L. W. Larsen, Bismarck, presented papers. The new president of the society is Dr. Otto Christian Gaebel, of New Salem; the vice-president is Dr. George Robert Lipp, of Bismarck; and the secretary-treasurer is Dr. Leonard Winfield Larson, Bismarck.

Dr. Charles Curtis Wallin, Lewistown, was elected president of the Fergus County Medical Society (Montana) on January 7, 1938. The new vice-president is Dr. R. J. Johnson, Harlowton; and the secretary-treasurer is Dr. Paul Gans, also of Harlowton. Dr. Wallin is also the society's delegate to the state medical convention, and Dr. Earl Stevens Porter, Lewistown, is his alternate.

Examinations for appointment to the grade of junior lieutenant in the Navy Medical Corps will be held at all Naval hospitals in the United States on May 16 *et seq.*, 1938. Physicians interested in these examinations should write to the Surgeon-General, Bureau of Medicine and Surgery, Navy Department, Washington, D. C., for information and procedure.

Necrology

Dr. G. Sheryl Cabot, 38, a graduate of the University of Minnesota Medical School in 1924, died in Jamestown, N. D., on December 16, 1937. Dr. Cabot was associated with his brother, Dr. Verne S. Cabot, Minneapolis, for 10 years; going to the DePuy-Sorkness Clinic in Jamestown. He was a member of state and local medical groups, and was a lieutenant-commander in the U. S. Navy Reserve Medical Corps.

Dr. Carl James Enmerling, 38, who practiced medicine for some years at Geddes, S. D., after his graduation from the University of Illinois College of Medicine in 1926, died in a hospital at Peoria, Illinois, on February 6, 1938.

Montana lost one of its pioneer physicians in the death of Dr. James Edwin Stuart, 72, of Livingston, on January 4, 1938. Coming to Montana from Iowa in 1867, Dr. Stuart settled in Deer Lodge with his father, one year later returning to Iowa. He returned to Montana in 1881. Beginning practice in 1901 as an osteopath, he took medicine at the old Willamette University School of Medicine, Salem, Ore., graduating in 1909. At the time of his death he was health officer for Park County.

Dr. Granville Howard Twining, 62, Mobridge, S. D., died on February 4, 1938, after an illness of several months. A graduate of the Rush Medical College of the University of Chicago in 1910, Dr. Twining was physician and surgeon to the Milwaukee Hospital, member of the Mobridge Clinic, and a fellow of the American College of Surgeons.

Dr. Albert Edward Taplin, 72, of Veblen, S. D., a graduate of the Royal College of Physicians & Surgeons (reorganized as Queen's University Faculty of Medicine in 1891) in Kingston, Ontario, Canada, died at his home on January 15, 1938. Dr. Taplin came to Wilmot in 1894, moved to Sisseton in 1901, and settled in practice at Veblen in 1914. He had been Marshall County physician, superintendent of the county board of health, and physician at the Government Indian school.

Dr. Carl August Wicklund, 62, who practiced at Wildrose, N. D., until 1932, died on his farm at Castle Rock, Washington, on January 30, 1938. A graduate of the old National Medical University in Chicago in 1906, Dr. Wicklund had been ill for some years.

Dr. John Lawrence Montgomery, 47, a former research worker in the University of Minnesota Medical School, and a member of the California State Medical Association, died at Los Angeles on January 24, 1938. He was graduated from the old Bennett College of Eclectic Medicine and Surgery, Chicago, in 1911.

Dr. Oley G. Bean, 68, pioneer North Dakota physician, died at Casselton on February 2, 1938. He was graduated from the University of Iowa College of Medicine in 1898, and had practiced at Finley until he came to Casselton in 1936.

Dr. Clarence E. Persons, 90, who had practiced in Marshall, Minn., since 1877, died at his home on January 4, 1938. He was graduated from the University of Michigan Medical School in 1877, and practiced medicine until 12 years ago.

Dr. Otto Fred Heidrich, 28, formerly of Echo and Crookston, Minnesota, died at Pasadena, California, during February, 1938.

Dr. Henry T. Norrgard, 49, of Milaca, Minn., died at his home on February 11, 1938. A graduate of the University of Minnesota Medical School in 1921, Dr. Norrgard was a past president of the East Central Minnesota Medical Society, former coroner for Mille Lacs County, former health officer for Milaca, and had been president of the Milaca Board of Education for the past seven years.

Dr. Charles P. Dolan, 80, Worthington, who was a pioneer Minnesota physician, died at his home on December 23, 1937. He had practiced 35 years in Worthington. A graduate of the University of Iowa College of Medicine in 1880, he was a veteran of the Yukon gold rush, first president of the Worthington Kiwanis Club, member of the first commission for the Southwestern Minnesota Sanatorium, and at the time of his death was city health officer and coroner.

Minneapolis, Minnesota
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New Series

Tuberculosis and the Physician

Kendall Emerson, M.D.

New York City, New York

Managing Director, National Tuberculosis Association

The British *Lancet* of May 8, 1937, remarks, "If common sense is to be applied to the elimination of tuberculosis, society must do more to tip the balance in favour of the patient rather than in favour of the tubercle bacillus." Science has out-run common sense in our program. It has furnished us knowledge of the cause of the disease and its method of transmission from man to man, and from animal to man. It has proved tuberculosis to be infectious and therefore preventable. It has mapped out a partially perfected system of treatment by following which many stricken with the disease recover.

The next long stride forward will come when we muster the common sense of the people to attack the social aspects of the campaign to eradicate tuberculosis. It will come when they realize that they alone can provide the environment and good living conditions which render preventive medical measures effective. When that happens, mortality from tuberculosis will not decline painfully at the rate of 3 per cent a year; it will drop with the speed of a business recession. The needed knowledge is available. The public is amply exposed to health education. The trouble isn't on the production line; it is due to a low ceiling in the consumers' market.

Every symposium like this of THE JOURNAL-LANCET makes its contribution toward lifting this ceiling. It does so through reaching the general practitioner of medicine whose attention is thus called to his rôle as a health educator in his community. It is he who can most effectively mobilize the common sense of his patients. A low tuberculosis death rate in his county is a fair measure of his contribution to public health and to social welfare.

Twentieth Century Case-Finding

H. R. Edwards, M.D.†

New York City, New York

CASE-FINDING is one of the major responsibilities of the New York City Department of Health. The isolation of the known case is a close ally in our program of control. Under no circumstances should the open case be permitted to circulate in the community and continually spread his infection to others. If voluntary means fail, then forcible methods should be employed, the same as is done in smallpox, diphtheria or other infectious disease control work.

Our case-finding methods include certain routine services, placing emphasis on the contacts to known cases, and newer methods of mass X-raying of the apparently healthy populace. This latter method is truly twentieth century in scope and action.

In our services, the X-ray plays a prominent part. Without it, we find that many early infiltrates would be passed over until their later extension produced the characteristic symptomatology of the disease, usually in the more advanced stages. Thus, since 1936 we require a routine chest X-ray of each case fifteen years or over admitted to our clinics. All under that age are routinely tuberculin-tested and the positives X-rayed, unless there may be obvious chest symptoms or pathology; then the child is promptly X-rayed. The justification for this procedure is, in part, clearly indicated in the classification of disease found. During 1937, when this plan was in full operation, the percentage of minimal lesions increased to 45 per cent, or 15 per cent over the previous year.

We operate nine consultation services for the private practitioner. The work of two of these clinics over a period of years has been recently reported in the literature^{1, 2}. These reports represent the result of examination of approximately 18,000 individuals. Steinberg and Barnard¹ found 17.2 per cent of their cases to be tuberculous. A classification of 1,733 cases for the year 1930-1935 showed an average of 35.3 per cent to be minimal. Pessar and Edwards² classified 25 per cent of their cases as minimal, and approximately one-half of the diagnosed group were considered as clinically active. Of this latter group, 39 per cent had bacillary sputum. Undoubtedly the reason for the rather low per cent of minimal lesions found in this type of service is due to the fact that the cases are referred almost invariably on the basis of symptoms.

Mass Survey Methods

The mass survey method has been developed in New York City because experience both here and elsewhere has clearly indicated that with proper selection of the group to be studied, we may expect to find an appreciable number of new cases, usually minimal in extent and therefore more easily curable. This hypothesis has been

† Director of the bureau of tuberculosis, New York City Department of Health.

proven to our satisfaction in our own experiences within recent years.

This work was started in 1933 through the generous support of C.W.A., and has been continued until the present as a W.P.A. Project. In addition, we have gradually developed other phases of this work with our own funds. It is our purpose to make the survey of apparently healthy individuals an integral part of our program.

This work has been possible only because we have had the rapid paper X-ray. The large numbers that we have reached could not have been handled with ordinary machines and methods. The rapid paper X-ray offers conveniences of identification and mass action that are unique. Thus we have with a single machine X-rayed 1,000 persons in an eight-hour day. Furthermore, the unit cost is considerably lower than would be possible with ordinary equipment. We have also made extensive use of paper films in cut sheets in our routine clinic work at a cost about one-half that of celluloid.

In presenting our experiences in this field, an attempt will be made only to outline broadly policies, gross numbers covered and results obtained, as in each instance the complete material has either been published or is being prepared in detail and will appear later.

Home Relief Clients

As stated previously, much of our work in this field has been made possible through C.W.A., or W.P.A. project grants. The staff, most of the equipment, and materials have been supplied through these sources. The Department of Health has had full responsibility for organization policy and supervision. We have worked closely with the home relief bureau in the securing of names of relief clients. Two general methods have been employed in contacting families. Investigators have been given lists of all families on relief by district and visits were made to invite those persons ten years or older, particularly those over fifteen years, to come to the clinic for an X-ray. In no instance has it been compulsory. In some districts postal cards extending the invitation and signed by the commissioner of health were mailed. In addition, all health and social agencies in the district have been asked to use their influence in securing coöperation when their workers were in these homes. More recently, the home relief bureau has included a slip with the relief check, urging coöperation. A variable amount of newspaper publicity has been available, but not extensive, because it was felt inadvisable to publicize this particular group of the population.

The response to these overtures has varied from about 20 to 50 per cent coöperation. Generally speaking, the coöperation was better in the earlier years than at

present, probably because the type of family on relief in 1933 was generally of a higher type than those now listed. Opportunities for employment have within past years removed many from the relief rolls who were by and large a more coöperative group.

The follow-up of suspicious or definite cases was from the outset considered an integral part of the program. Until 1935, all cases designated for further study were referred to their district clinic. This proved to be an excessive burden on existing facilities. Thus, since 1935, we have developed our surveys in those areas presenting an acute problem and in which there was need of additional clinic service. The survey then served to build up a regular clinic unit, and when established, the survey feature was removed to another area.

The individual coming for examination is routinely X-rayed by the rapid paper method. All films are first rapidly reviewed to detect serious lesions in need of prompt attention. Later, the rolls are carefully reread by at least two trained physicians, at which time all diagnoses are recorded, and appropriate action taken in each.

The first of these studies in New York City was done in 1933 by Barnard³. Two rather distinct areas were covered; the first in Central Harlem, which is predominantly Negro, and the second in the Red Hook-Gowanus area of Brooklyn, which is predominantly Italian. There was a total of 18,749 individuals; 10,232 from Harlem and 8,517 from Brooklyn. Of the total X-rayed, 14.8 per cent were designated for further study, 11.8 per cent as suspicious of tuberculosis, and 3.9 per cent as presenting definite cardiac pathology on X-ray. The significant findings in this study may be briefly summarized as follows:

1. Two-and one-half per cent were diagnosed as definite tuberculosis.
2. The highest amount of tuberculosis was found among the Porto Ricans. The differences between white and Negro were not significant.
3. The yield of definite tuberculosis was from six to ten times as great among those over twenty years as compared to those below that age.
4. Approximately 75 per cent of tuberculosis diagnoses were classified as minimal lesions.
5. Cardiac abnormalities were found in 3.9 per cent of those X-rayed.

The material from the Red Hook-Gowanus area was further analyzed by Downes⁴. She found the same increase in disease in the older age groups, and stated, "The implication of the data presented in this study is that for the most part tuberculous lesions, designated as important tuberculosis, are acquired during adult life and the prevalence increases throughout life."

This report also analyzed the results of the examination of contacts to cases discovered in the survey. In general, there was evidence that practically all of the significant cases in the families had been detected in the survey.

Lower Manhattan

The second mass survey was started in the early part of 1934, and covered the lower part of Manhattan. For the most part, this area is inhabited by tenement house dwellers, and therefore represents the lower economic levels. In this same general district is the Bowery, where approximately 20,000 transient and homeless men reside, although practically none was reached in the survey. More recent organization of this group will, we hope, make it possible to keep them under stricter supervision.

In this survey, we X-rayed by the rapid paper method 25,170 individuals. It is of interest to note that in the 20,976 families approached there were 56,259 individuals ten years of age and over, of this number 25,170 or 44.7 per cent actually attended the clinic.

There were 1,187, or 4.7 per cent, diagnosed as having pulmonary tuberculosis. Clinical examination of 1,112, or 93.7 per cent, of these cases classified 685, or 61.6 per cent, with definite tuberculous lesions; 368, or 53.7 per cent, of which were found to be active cases. Of the total, 89.6 per cent, were previously unknown. Preliminary figures show that 403 contacts to the above cases were examined later, among whom we found 3.7 per cent with definite tuberculosis. This compares favorably with a study reported by Downes⁴ from material in the Red Hook district; in which she concluded that by far the majority of the tuberculosis was found on the original survey. Within six months, approximately 21 per cent of the active cases had been admitted to a hospital.

Meinhard

In July 1935, we moved the survey project to the Meinhard district in Upper East Manhattan. Into that area have recently moved large numbers of Spanish-speaking persons. By and large, they represent a very low income level, and the majority are on relief. The clinic in this district was set up with the idea that permanent quarters would remain at the conclusion of the survey. The survey period ran for the fiscal year, July, 1935, to June 30, 1936, although additional work of a survey nature was continued until December, 1936. The work in the former period is reported here.

There were 3,214 persons X-rayed, with the following findings:

1. Two hundred and seven, or 6.4 per cent, were found to have pulmonary tuberculosis.
2. One hundred seventy-two, or 83.1 per cent, were classified as minimal lesions.
3. One hundred and nineteen, or 57.5 per cent of all pulmonary lesions, were considered to be clinically active and in need of institutional care.
4. Ninety-five, or 3 per cent, showed cardiac lesions.

During the course of this survey we arranged with the City Hospital to keep available about ten beds to which we could refer cases in need of immediate care, or those requiring further study to clarify their condition. The plan was most successful for we were able to clear cases without delay, and several suitable for pneumothorax

were hospitalized promptly for their initial refill, and discharged within a short time to ambulant care.

Harlem

In December of 1936, we moved the project to the lower part of the Harlem area. The New York Tuberculosis and Health Association contributed by providing a year's rental for excellent quarters. Through W.P.A., extensive remodeling was done so that for the first time we had adequate quarters for the clinic and clerical staff at the same place. The quarters provided for a suite in which we installed the rapid X-ray unit and dressing cubicles, and in addition, we had ample space for a permanent X-ray, fluoroscope, and examining space to carry on the follow-up service. Thus, both services could operate simultaneously.

In returning to the Harlem area, we planned to cover the entire district, and hoped to open the service to any person who might be willing to come. Problems over which we had no control required that we devote our attention again to the relief families. It is estimated that 41 per cent of the families in the area are on home relief. This area of the city has a high concentration of Negroes and Porto Ricans, and presents the highest tuberculosis mortality of any area in the city.

At the close of 1937, we had X-rayed 38,456 persons from relief families, among whom we found 756, or 2 per cent, diagnosed as pulmonary tuberculosis; 589, or 77.9 per cent, were classified as minimal lesions.

Abnormal cardiac silhouettes have been a rather consistent and important accessory finding in our X-ray survey work. For the most part, the case was either unaware of the condition, or if it was known, he was frequently not under care. Further study of many of these cases revealed a luetic background. There have been a variety of other intrathoracic conditions revealed, such as bronchiectasis, emphysema, malignant tumors, foreign bodies and a host of other changes of academic interest.

Other Large Scale Surveys Food Handlers

An earlier survey of food handlers was made by Martin, Pessar and Goldberg⁵ through facilities in one of our clinics. This survey was made prior to the development of the rapid paper method, and therefore required much longer for its completion. Two thousand persons selected at random were examined and X-rayed. The authors found 2.3 per cent with active tuberculous lesions, and 1.7 per cent with latent adult types. Thus, this study indicated that in our estimated food handler population of 325,000 individuals, there must be approximately 6,500 unknown, and therefore uncontrolled cases.

High Schools

During the past year, we have utilized the W.P.A. project facilities to make several studies in high school groups. In approaching this group, we are anxious to set up some basis of values upon which we can determine future policies. Primarily, we are working in those

schools in which we can secure a high percentage of co-operation. In one we had requests from 90 per cent of the student body for tuberculin tests and X-ray. In another, we had about 98 per cent. Thus, these studies will give an accurate cross-section of our high school population. The complete study will involve about ten thousand males and a like number of females; also, racial and economic factors will be considered.

At the close of 1937 we had worked in three high schools, and had X-rayed a total of 6,325 pupils. Table I shows the gross findings of this study.

The Wadleigh High School is for girls and is located in Harlem. In this study, the tuberculin test was not used, because we were desirous of reaching as high a percentage as possible. Adolescents are notably more difficult to interest in such procedures than children in the elementary grades. The enrollment at this school is about 4,000. One reason for not reaching more than we did is that the pupils were requested to come to the survey clinic in groups, and many dropped out in transit. In this sort of work it is of the greatest importance to take the X-ray machine to the school. This, of course, is a simple matter with the rapid paper camera, and with the speed of its operation, an average school population can be X-rayed with the minimum loss of time or interference with class work.

The Benjamin Franklin and Stuyvesant high schools are for boys, the former representing perhaps a lower income level than the latter. In the former school, we used tuberculin in 0.1 mg. doses and in the latter, both 0.1 and 1.0 mg. doses, and in both schools all were X-rayed regardless of tuberculin reaction. We also set up our machine on the premises, and effected a much more efficient service. The high percentage of coöperation in these schools is a tribute to the interest and organizing ability of the school faculty. As a matter of fact, in the Stuyvesant High School the health education division approached the department requesting a study, and on their own initiative returned requests for tuberculin and X-ray on over 90 per cent of the first 1,200 pupils approached. While all credit is due the faculties in these schools, it also appears that our consistent educational efforts in the past are really leaving an impression on the community.

While the amount of disease found among high school groups is considerably less than among adults, it should not be concluded that all effort in that field should cease. We are endeavoring to find the opportune time for intensive work in this field. The factors of age, sex, race or year in school must be evaluated. This we hope to find by increasing our numbers and by the routine re-X-ray of graduating classes in the above schools.

Applicants for Employment

Since 1936, we have conducted three interesting studies among employees assigned to the City Department of Health staff, applicants for the uniformed force of the Fire Department, and more recently applicants for licenses as guides. Table II shows the extent of this work at the close of 1937.

TABLE I. X-Ray Survey of High School Pupils

High School	Number X-Rayed	D I A G N O S I S					
		Per Cent			Number		
		Pulm. Tbc.	Suspects	Cardiacs	Pulm. Tbc.	Suspects	Cardiacs
Wadleigh	1635	0.9	2.0	7.2	14	33	118
Benjamin Franklin	1905	0.4	0.0	1.0	8	0	19
Stuyvesant	2785	0.08	0.4	0.6	2	11	17

TABLE II.
X-Ray Examination of Applicants to Service in Department of Health, the Fire Department and Guides

DIAGNOSIS	Per Cent			Number		
	Health Dept.	Fire Dept.	Guides	Health Dept.	Fire Dept.	Guides
Pulm. Tbc. Active	2.2	1.3	2.0	15	25	2
Pulm. Tbc. Arrested	4.7	0.5	6.0	31	9	6
Non-Tuberculous Pathology	2.2	0.4	0.0	15	8	0
Observation	2.4	2.0	4.0	16	40	4
Negative	88.5	95.8	88.0	590	1882	88
Total	100.0	100.0	100.0	667	1964	100

These groups were X-rayed first on paper film in cut sheets at our Central Clinic. This method was used because the applicants came throughout the year, and not in groups large enough at a single time to make the rapid paper method feasible. Those showing suspicious or definite lesions of whatever character were called back for further study. In all instances this included a history and physical examination, and in most cases a new X-ray on celluloid film. At the outset, we used celluloid film generously to check the comparative value of the paper film. After careful analysis we found that in not over one per cent did the celluloid show more than the paper and this included early infiltrates not readily seen on either type of film. The reason for difference in some cases could be accounted for by the difference in angulation of tube or the positioning of the patient.

The applicants for the City Health Department were of both sexes and were eighteen years old, or over. Some showed arrested lesions and were aware of its existence, as did one with an active lesion; otherwise our findings were the first evidence of disease to the individual. As this group can be supervised for a long period, we are repeating X-rays for an indefinite period to learn, if possible, what changes may occur in apparently healed lesions.

The applicants for the Fire Department present an interesting group for study because they are young men between twenty-one and thirty years, in apparently excellent health. They have passed a limited physical examination by the Civil Service Commission, and there is nothing in their history to suggest exposure or experience with the disease. From outward appearance, they represent the best of physical specimens, above average height and unusually well-developed. Almost without exception, the findings in this group were entirely new to them. In handling this group, our recommendation to pass or reject them has been determined by the extent and type of lesion. The lesions passed must not be more than the residuum of a primary complex, or a parenchymal lesion confined to the apex, or if at another location, of no greater extent. The parenchymal lesion must be thoroughly healed, the applicant being deferred for

a period sufficient to show by X-ray and other evidence an arrested lesion. The fact that these men are exposed to excessive hazards, such as fumes, smoke and gases, and may be required to spend long periods in wet clothing in adverse weather conditions, demands greater care in determining the stability of their lesions.

The guides were examined because a recent law required that they be licensed by the city. They work on sight-seeing busses, and while their contact with the public is limited, we nevertheless feel that if there are open cases among them, they should be controlled. Of those examined thus far, the majority are in the older age groups, and the lesions found are of the chronic productive type, all of which were free of bacilli.

The department is working on plans to start sampling of other groups that may prove of importance in case-finding: the adults attending the social hygiene clinics, the males committed to the Riker's Island Penitentiary, females committed to the House of Detention, the homeless men in the Bowery, and other similar groups. Thus, within a reasonable period, we hope to have sufficient evidence upon which to formulate a practical program of mass case-finding.

Summary

Conceding that the isolation of the open case is fundamental in the ultimate control of tuberculosis, at least half of our effort should be placed on case-finding programs. In New York City we have established district clinics to which any resident may be admitted, and special consultation services for the use of the private practitioner with patients unable to pay standard fees. These services are being developed to their maximum capacity, and must be increased to give complete coverage to the city in our routine work.

The patients using these services are, as a rule, contacts to known cases, or else they have some symptom as a basis for their admission. Their examination and supervision is justly a first charge on our facilities.

Experience has clearly indicated that many of our new cases reported at or before death have in all probability been open cases and thus unknowingly have spread disease to countless others. Thus a vicious circle is set up.

Experience further teaches that the routine X-raying of apparently healthy persons will not only reveal new disease, but that the majority of the lesions thus found will be minimal in extent.

The Department of Health since 1933 has developed this method as extensively as funds would permit. Thus far we have reached about 100,000 persons of various age groups, and economic and racial backgrounds, and we are convinced that the method is practicable.

Our experience thus far clearly indicates that the maximum results may be obtained if such efforts are

directed to those persons twenty years or older, those in the lower economic scale and the dark-skinned races.

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Tuberculosis Among Older Age Groups*

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ONE of the persistent misconceptions held by the general public about tuberculosis is that it never occurs in the older age groups. This belief has an ancient lineage, dating back to days when only consumption was recognized, and when every person affected was fatally doomed in the minds of his relatives and friends. Of more significance is the fact that even in medical circles the impression is current that old age insures a protection against tuberculosis. Emphasis has been laid on the importance of tuberculosis in childhood and the prime of life, but the prevalence of tuberculosis in the older age groups has not been stressed in proportion to the vital aspects of the situation as a public health problem. This study was undertaken in an attempt to learn the actual conditions in this community of persons fifty years of age or over, since there has been a definite increase in the percentage of older age groups in the population.

Schmid¹ has shown graphically the shifting of the age groups for the state of Minnesota. This consists of diminution from 1900, to and including 1930, of all the younger age groups, with an increase in the people over 45 years of age.

The city of Minneapolis, from which Glen Lake Sanatorium gets the majority of its patients, reflects a condition similar to that of the state, as is shown in the first table.

TABLE I.

Population Over 45 Years of Age		Population Over 55 Years of Age	
	1910 1930		1910 1930
State of Minnesota	18. % 24. %	State of Minnesota	9. % 14. %
City of Minneapolis	18.2% 24.5%	City of Minneapolis	7.9% 13.2%

Since many more older men than women were admitted to the Sanatorium during the twenty-one year period studied, the facts in Table I were also considered from

* I am greatly indebted to Miss Marion Wilder for assembling many of the details presented here.

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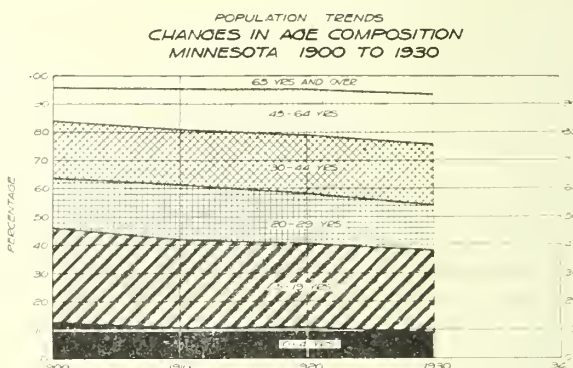


Chart I. —Calvin F. Schmid

the standpoint of sex. Table II shows that there is no disproportion of older men between the city and the state, indicating that there was no influx of older men into the city of Minneapolis over this period.

TABLE II.

Male Proportion — 1910-1930		Over 55 Years	
Over 45 Years		1910	1930
State of Minnesota	19. % 25. %	State of Minnesota	9. % 14. %
City of Minneapolis	18.7% 25.3%	City of Minneapolis	7.9% 13.3%
Female Proportion — 1910-1930		Over 55 Years	
Over 45 Years		1910	1930
State of Minnesota	18. % 23. %	State of Minnesota	9. % 13. %
City of Minneapolis	22.2% 23.2%	City of Minneapolis	8. % 12. %

From January 4, 1916, when Glen Lake Sanatorium was opened, until January 1, 1937, there had been 7,212 admissions, of which 3,457 were males and 3,755 were females; or 298 more females than males. During these twenty-one years, 996, or 13.8 per cent, of the people admitted have been over fifty years of age, and the number of men over fifty was much greater than that of women; namely, 722 men and 274 women. Arranged

by years, the proportion of admissions of persons over fifty for each year is shown in Chart II.

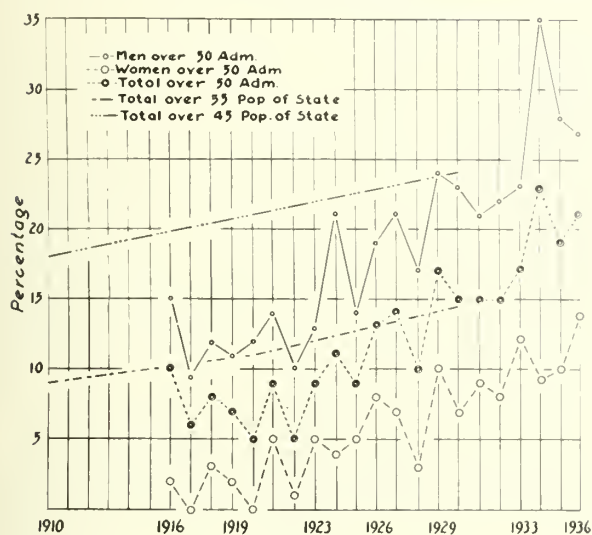


Chart II.

In 1916, there were 134 cases admitted. Thirteen of these, or 10 per cent as shown by the chart, were over fifty years of age. We find the lowest percentages were in 1920, and again in 1922, only 5 per cent, and the highest percentage, 23 per cent, was in 1934. This graph shows the very definite increase in this group during the past twenty-one years. The trend of this increase of admission has been greater than the trend of the population of these age groups in the state as a whole, as shown in the chart, where the proportion of people over fifty-five years of age and the proportion of people over forty-five years is shown for the census years of 1910, 1920 and 1930.

Chart II also shows the proportions of men and women admitted for the various years. Fifteen per cent of the men admitted in the year of 1916 were over fifty years of age, while of the women only two per cent were in this group. The percentage of men is definitely greater than that of women for every subsequent year.

The highest point for men was in 1934, when 35 per cent of all men admitted to this Sanatorium were over fifty years of age. From casual observation, the obvious explanation of this peak of 35 per cent would be the depression with its concomitant poor food and shelter for men of this financial status. This, no doubt, was an important factor for that particular year as investigation showed that 36.7 per cent of the men admitted were indigent. It was undoubtedly also a factor for the years 1933, 1935 and 1936, as the percentages of the indigent were higher during those years than formerly. Another factor which may account for the increased number of men admitted is the observation that the intelligence level of the men was lower than that of women and even though 42 per cent were self-supporting, many were untrained, while of those who had some training, their work was such that it brought them relatively small income.

Considering the entire group over the twenty-one year period, 31 per cent were classed as indigent. The remaining 69 per cent includes self-supporting, partially and wholly dependents. Analysis of random cases in these last three classifications showed that these individuals lived in a home with some relative. The significance of this fact will be discussed under the residential distribution.

The residential distribution of the whole group, both male and female, showed that 165, or 16.5 per cent, lived in the slum district. Except for their contacts with others of the same economic level, the potentialities of these 165 persons as sources of infection of tuberculosis are somewhat circumscribed. The picture changes with the remaining 83.5 per cent. Their potentialities as a source of infection are definitely greater, scattered as they are throughout the remainder of the city and county, their contacts are more intimate, and their association with the younger generations makes their disease the crux of the situation in tuberculosis in the older age groups. Those persons who are now of fifty years and over have been influenced the least of any of the age groups by the advances made in tuberculosis control in the last twenty years, since it is probable that many of them had been infected before the full force of the treatment and isolation program was in effect. The incidence of infection in this age group could only be estimated; but it is certain that it is much higher than the school child-university student group that have shown definite progressive decreases in the incidence of infection.

While it is possible that a few of these cases may represent a recent first infection with a subsequent rapid course of the disease, it is more likely that the debilitation coincident with old age, and in some cases privation, accounts for the ascendancy of an infection which in the more vigorous younger years was held in check by the body's mechanism. Improved methods of diagnosis, including the tuberculin test, X-ray and laboratory examinations, also play some part in the increase of recognized tuberculosis in these age groups.

Among the 996 patients over fifty years of age admitted to Glen Lake Sanatorium from 1916 to 1937, 875 had pulmonary tuberculosis, 40 had extra-pulmonary tuberculosis, 39 were classed as non-clinical tuberculosis or tuberculosis suspects and the remaining 42 were considered non-tuberculous. Of the forty cases of extra-pulmonary tuberculosis, the most common type was that of bone tuberculosis. In these cases, the signs and symptoms were advanced enough so that the problem of diagnosis was simple. In the cases classed as non-clinical tuberculosis and tuberculosis suspects, the problem was more difficult. All these cases had been referred to us as tuberculous; their signs and symptoms suggested it, and our diagnosis of inactive lesions was arrived at only after a period of observation. These people for the most part had lesions in their lungs, discernible by X-ray, which might become activated any time. They, therefore, present potential sources of infection, and as such require yearly examinations if the health of their associates is to be considered.

The 42 cases classed as non-tuberculous were found to be free from X-ray evidence of tuberculosis, and also found not to react to tuberculin. Eight hundred seventy-five, or 88 per cent, had active pulmonary tuberculosis.

Of the 875 who had pulmonary tuberculosis, 94 per cent had the advanced form of the disease. The mildness of the course of the disease as usually seen in the older age groups masks the true condition so effectively that no suspicions are aroused in the minds of either the patients themselves or their relatives and adequate early examinations are unthought of. Their symptoms were usually not marked and for the most part had extended over a period of years, another misleading factor. Cough and expectoration were the symptoms most frequently encountered, and because of the fact that they had troubled the patients very little, these symptoms had been overlooked. The long period over which these patients had their symptoms and the fact that most of them had the advanced form of tuberculosis, with sputum potentially if not actually bacilli-laden, made these patients probable health menaces over a considerable period of time. Hence, tuberculosis in the older people pursues for the most part a chronic course, and the few symptoms that are present are not striking, and are usually attributed to various conditions, among them old age. However, we must not conclude that tuberculosis in an older person is always chronic, as we occasionally find a case which appears to run a relatively acute course, such as the following:

A housemaid, aged 64, single, was admitted on March 23, 1937. She had not felt well for one month prior to admission. The symptoms were weakness, loss of appetite, loss of weight. She first sought medical attention one week prior to admission, and a definite diagnosis of tuberculosis was made. She died ten days after admission, of a very far-advanced pulmonary tuberculosis.

The complications encountered in our cases were more frequently non-tuberculous rather than tuberculous, and included all the conditions generally associated with old age, such as arthritis, heart lesions, nephritis and arteriosclerosis. This is in sharp contrast to the disease in younger people, in whom there is a tendency for the disease to be of a less chronic nature, and in whom the complications are for the most part tuberculous.

The increase in the percentage of admissions of older people is perhaps not surprising when considered in the light of deaths from tuberculosis in Minneapolis during this same period. In 1916, it was 16 per cent of people over fifty, while in 1936 it was 41.3 per cent. It is of interest to note that during this period, the death rate from tuberculosis dropped from 147 to 40.

That this increase in deaths of people dying from tuberculosis is not wholly a local condition has been well

shown by Drolet², who brought out the following facts tabulated below:

Tuberculous Deaths in Persons Over 50 Years

	1914	1934
New York City	16.9%	27.1%
Chicago	14.8	21.7
State of New York	18.3	28.4
State of New Jersey	17.8	27.5
United States	19.5	28.4
England and Wales	17.0	22.9
In Minneapolis for these same years it was:	14.9	40.7

The larger proportion of deaths from tuberculosis now occurs, as it has heretofore, in the age groups before fifty, so that the bulk of our problem is the same as it has been. The recognition of tuberculosis in the older age groups then must be in addition to our present efforts. Both groups must be considered as part of the whole and treated accordingly.

Discussion

While the facts pertaining to the admissions to this Sanatorium deal with a relatively small number of individuals, it is felt that they are representative of the conditions existing elsewhere in the United States, and in particular, the northern half.

Now, more than ever before, tuberculosis must be considered as a possible clinical entity when patients over fifty years of age present themselves for examination. While the death rate from tuberculosis has always been high among the older age groups, the proportion of people with known tuberculosis has increased in the past twenty-one years.

The increase in tuberculosis among older people can in part be attributed to: (1) Better diagnostic procedures, which although not yet discovering minimal tuberculosis in an appreciable number of instances, are discovering advanced cases before they reach the terminal stage. (2) Better education among the laity regarding symptoms of tuberculosis, causing them to seek medical attention sooner and more regularly than previously. Yet greater stress must be laid on the mildness of the symptoms in this age period, if minimal cases are to be found. (3) Increase in the number of persons reaching the age of fifty and over.

Recommendations

While tuberculosis in the home presents a more serious problem, examination of the group of indigent males would be rewarding. Thorough investigation of all older persons who cough, even slightly and who expectorate, even if only occasionally; the treatment and isolation of all such cases discovered in order to stop the infection of the coming generations by the last generation.

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Experiences with A New Approach to Tuberculosis Case-Finding

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TUBERCULOSIS is acknowledged by all to be difficult to find in its earliest manifestations as a clinical disease, since in so many instances it is well-advanced before it causes symptoms sufficiently severe to send the patient to his physician.

The diagnosis of tuberculosis is not so difficult if the physician can know whom to suspect and to whom to apply the proper diagnostic procedures. It then becomes a problem of examining large numbers of individuals who are presumably well in order to find the occasional one who has early tuberculosis. While an annual examination for everybody, sufficiently complete to rule out tuberculosis, is desirable, it has not as yet become practical. Therefore, some method of selecting those groups in the community which have a greater expectancy of developing this disease should be worked out, and means provided for examining the members of such groups.

Since the control of tuberculosis can be more rapidly attained by recognizing those who have the disease early, and providing for their prompt isolation and adequate treatment, it seems logical that if facilities are available for isolation and treatment, greater effort can well be spent upon the problem of case finding.

At the present time, with bovine tuberculosis quite well-controlled, the chief source of further infection is the person who has active tuberculosis.

The experience of most communities has been that fully eighty per cent of the cases of pulmonary tuberculosis are advanced beyond the minimal stage when first diagnosed, and consequently, present a more difficult problem as to treatment, and undoubtedly a more serious menace as spreaders of infection to those about them.

Recognizing that improvement in finding cases earlier was essential in controlling tuberculosis, the problem was approached in Detroit from a new angle through the coöperative effort of the Wayne County Medical Society, the Detroit Tuberculosis Sanatorium Board (the seal sale organization of the city), and the City Department of Health.

Method

At least two definite experiences in Detroit suggested that this problem should be attacked through the private physician in his own office practice, rather than through public clinics. The first of these experiences concerned itself with the successful practice of preventive medicine by the private physician in his own office, and has been well-demonstrated by the program for immunization

against diphtheria, which has been carried on since 1928 on a medical participation basis.¹

Under this plan, parents are encouraged to have infants and young children inoculated by their family doctor. If the parents are unable to pay for the service, a small subvention is paid to the physician by the City Health Department. This has been very successful in getting a high percentage of pre-school children inoculated and the disease cut to almost the vanishing point.

The second experience was that, after all, the private physician has been seeing more cases of tuberculosis first than any other agency, (in Detroit's experience, 63 per cent)² but since most of these persons come because they have symptoms, very few are found in the early stages of the disease.

Because the physicians of the community had demonstrated that a definite preventive procedure could be carried out by them and that they did see most of the tuberculosis cases first, it was felt that tuberculosis case-finding in the community could be best promoted by enlisting their aid. The private physicians in turn aided in this work by receiving assistance in getting people to their offices earlier and providing a small subvention for tuberculin tests and X-rays when the patient could not pay.

To make such a plan feasible, an extensive campaign of education was undertaken designed to:

1. Enlist financial support from the community through public funds by pointing out the poor economy of large expenditures for long and costly treatment of advanced cases of tuberculosis, when more money spent on case-finding would result in much lower cost to the community through the shorter hospital stay of early cases and the lessened number of cases developing through contact.
2. Arouse the public to the necessity of seeking a careful examination to make certain that they individually do not have tuberculosis.
3. Acquaint the medical profession in the steps of the campaign; the use of the tuberculin test and the X-ray in the diagnosis of tuberculosis, and the enlistment of their coöperation in providing examinations for the presumably well person.

The success in attaining the first objective in the educational campaign has been previously reported.³

Suffice it to say that funds were made available; to provide a subvention to physicians for tuberculin tests and to roentgenologists for the taking of X-ray films;

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to augment the public health nursing staff so that nursing visits could be extensively made to encourage persons to go to their physicians for examinations; to provide expert statistical supervision and clerical help for records; to provide postgraduate instruction for physicians in regard to tuberculosis; to make possible the position of medical relations director, whose work includes contacting physicians in their own offices to acquaint them with the plan and with its techniques; and to augment the health education staff of the City Health Department so that the public may be informed of the plan and be prepared to participate.

Since examinations could not be provided for everyone, at least, at once, it was decided to center the efforts on those groups of persons in the community which it was thought would yield the most tuberculosis.

Physicians were instructed then to examine three groups, namely, all contacts to known cases of tuberculosis; secondly, persons who came into their practice whom they might suspect of having tuberculosis; and, thirdly, all those persons residing in parts of the city where the mortality from tuberculosis was known to be excessively high.

The method of examination consisted in making a tuberculin test for all persons, children and adults alike, and then referring to a coöperating roentgenologist all positive reactors. The roentgenologist reported the results of his X-ray examination to the original physician, who then informed the patient as to the result. If tuberculosis was found, treatment was advised, ordinarily in the hospital. Those patients able to pay the physician and the roentgenologist for these examinations were expected to do so, but if not able, the physician then could bill the City Health Department for the nominal fee provided for this purpose.

Results

The results of the first year's effort in this program have been very gratifying.

The physicians have evinced a splendid interest in the work, over 1,000 having signed up to coöperate, and 461 actually have reported tests made. Forty-three different physicians have reported X-ray work done, of whom 21 are roentgenologists and 23 physicians with X-ray equipment suitable for taking good films of the chest, and who take films of their own patients but who do not accept reference work.

There have been 74,729 tuberculin tests reported, of which 19,575, or 26.2 per cent were positive reactors. This group is made up of both children and adults, so the percentage is lower than might at first be expected. In making an age distribution in the tests reported between April 12, 1937, and December 31, 1937, numbering 59,512, the following percentages were found positive:

TABLE I.
Positive Tuberculin Tests by Age Groups

0—9 years, inclusive	6.0%
10—19 years, inclusive	19.1%
20—29 years, inclusive	37.6%
30 years and over	41.6%
All Ages	28.3%

Of the 19,575 positive reactors, 16,160 had been X-rayed by December 31, 1937, and as a result of these examinations, 410 cases of clinically active tuberculosis have been definitely diagnosed, not counting a large number of suspicious and questionable cases that have been excluded as definite cases.

Of the adult pulmonary cases, 29.1 per cent were minimal and only 28.4 per cent were far-advanced, a marked improvement over the previous experience as to cases reported by private physicians which in a study made in 1935 revealed 13.5 per cent minimal only and 42 per cent far-advanced.

Of the total number of cases, 366 were classified as adult pulmonary and that they are in addition to those reported through previously existing efforts is shown by the fact that there were approximately this number of cases reported in excess of the number reported the previous year.

The pulmonary cases reported from all sources for the last few years is given in Table No. 2.

TABLE II.
Adult Pulmonary Cases Reported by Years

1934	2,019
1935	2,052
1936	1,936
1937	2,371

With the public more alert in seeking examinations, the large number of physicians actively coöperating, and facilities available to care promptly for the cases found, it would seem that a definite advance has been made toward the control of tuberculosis which should become even more effective as time goes on.

Summary

The need for finding tuberculosis earlier in its development has been recognized as fundamental in controlling this disease.

A definite plan for the participation of private physicians in tuberculosis case-finding in their own offices was undertaken.

The first year's results of this plan indicate that it can be successful in uncovering tuberculosis earlier than with previously used methods.

The close coöperation of the medical profession and the public health agency is essential in the practice of preventive medicine.

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The Management of Tuberculous Pleural Effusions

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PLEURAL effusions of tuberculous origin are commonly seen in general practice. Naturally, it is impossible to give the exact incidence, as some of the patients presenting this condition never enter the sanatorium. Too often the attention of the physician is centered entirely upon the fluid present in the pleural cavity, while the underlying pathology is disregarded.

Before a tuberculous pleural effusion can be correctly managed, knowledge of two factors is necessary; first, proof that the fluid is of tuberculous origin, and secondly, the determination of the pathologic process underlying the formation of the fluid. Turning then to the diagnosis: the onset of a tuberculous pleuritis is usually acute; the temperature is elevated from 102 to 103 degrees, and pain is present over the affected side of the chest. This pain is acute and is exaggerated by respiratory movement. As soon as an effusion is formed, the pain disappears owing to the separation of the parietal and visceral pleura. The patient, during the acute stage of the disease, does not appear ill—he appears miserable.

Physical examination, after the formation of fluid, reveals a flat percussion note over the fluid area. The breath tones are distant to entirely absent. The X-ray shows an opacity corresponding to the area of fluid on the involved side. The X-ray may or may not show an associated parenchymal tuberculous infiltration. This will be discussed more fully later in the paper. Definite diagnosis is established by the aspiration of 20 to 30 cc. of the effusion present in the pleural cavity. Upon aspiration, the fluid is found to be clear and straw-colored; specific gravity is above 1.010, while lymphocytes will be the predominating cell in the fluid, and in many cases may reach as high as 100 per cent upon differential count. The fine coagulum formed in the fluid upon standing should be selected and stained with the usual Ziehl-Neelsen technic in order to demonstrate tubercle bacilli. In many instances, this will prove negative. Guinea pig inoculation shows the highest percentage of positive findings.

There are a certain number of pleural effusions from which tubercle bacilli cannot be recovered by either direct examination or animal inoculation, yet the future course of the patient would show that the effusion was of tuberculous origin. Therefore, one should not be dogmatic in stating that an effusion is not of tuberculous origin merely because the organism cannot be recovered.

In considering the differential diagnosis, malignancy of the lung must be eliminated. However, as a general rule this occurs after the fourth decade. Usually there are other symptoms preceding the effusion, thus permitting correct diagnosis at an earlier stage. Chronic adhesive pericarditis or Pick's syndrome is likewise to be con-

sidered. Cardiac decompensation will produce a transudate in the pleural cavity. Very often this is bilateral in nature, and the presence of the associated heart disease suggests the correct diagnosis. Occasionally a hemothorax is encountered. However, here we have a previous history of trauma with a resultant pathologic change in one of the larger blood vessels. Tularemia as an etiologic agent of pleural effusions must be considered in those localities where this disease is endemic. Other conditions rarely encountered are chylothorax and hydatid disease of the lung. One is safe in saying that 98 per cent of all pleural effusions are due to tuberculosis of the underlying pleura. Therefore, every pleural effusion should be considered tuberculous in origin until definitely proven otherwise.

Tuberculosis of the pleura represents a re-infection type of tuberculosis; not a primary infection as it is sometimes erroneously considered to be. Paterson¹ definitely shows by experimental work that pleurisy with effusion due to tuberculosis is produced only in the presence of hypersensitiveness. The infection usually reaches the pleura by direct extension from an underlying focus in the lung. In some instances, the infection can be traced to a caseous tuberculosis of the thoracic lymph nodes or of the chest wall.² It has also been shown that tubercle bacilli may be carried to the pleura by way of the lymph and blood vessels.³

When the pleura becomes infected with tubercle bacilli, there is a resulting acute inflammation corresponding to the localization of the tubercle bacilli. This is followed by an abundant serofibrinous exudate composed chiefly of serum exudate with a variable amount of fibrin. The mesothelium of the pleura undergoes degenerative changes and the pleural surfaces become coated with a more or less dense layer of fibrin. The subjacent layers become infiltrated with lymphocytes and fibrin and the underlying lung is involved in the inflammatory process to a greater or less degree. The intensity of the allergic phenomena results in the pouring-out of abundant exudate through the highly permeable pleura which gradually ceases with the subsidence of the inflammatory reaction. It is my belief that the extent of the effusion corresponds to the hypersensitiveness of the patient. The important points to bear in mind in this pathologic process are that tuberculosis of the pleura is an allergic phenomena due to re-infection of the individual by tubercle bacilli, and that this infection may represent a direct extension of a tuberculous focus in the underlying lung. To further emphasize the importance of this statement may I point out that out of 21 cases of pleural effusion recently admitted to the State Sanatorium, there occurred definite parenchymal infiltration in 13 or in 61.9 per cent of the cases. At Saranac Lake Sanatorium it has been found that 75

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Figure 1.
Case No. 4101 - 1-18-37

Exudative infiltrate of proven tuberculous origin involving right hilar area.

per cent of the pleuritis with effusion occurred when definite pulmonary tuberculosis was present.⁴

Tuberculosis of the pleura may also be the first manifestation of a blood stream dissemination of tubercle bacilli. This is amply illustrated in the following case:

C. O. (File No. 4001) A 22-year-old male was admitted to the Sanatorium on 8-17-36, with the history that in the spring of 1935 he developed an acute pain in the right chest. This was diagnosed as pleurisy, and he was told that there was fluid present in his chest at that time. The patient felt well at the end of three weeks and continued to feel well until the fall of 1935, when a swelling of the right testicle developed. This was removed and on biopsy it was found to be tuberculous in nature. Following the removal of the testicle, the patient's condition improved until May, 1936, at which time swelling of the left testicle developed. This proved to be a tuberculous epididymitis. The patient was admitted to the Sanatorium on 8-17-36. Because of previous evidence of a genito-urinary tuberculosis, a cystoscopy with retrograde pyelograms was done. At this time a tuberculosis of the right kidney was found. On 10-17-36, the right shoulder became swollen and X-rays showed tuberculosis involving the head of the right humerus. On 11-14-36, a prominence of the spine of the ninth thoracic vertebra was noted and X-rays at this time showed tuberculosis involving the 8th and 9th thoracic vertebrae with a complicating paravertebral abscess. While the patient's condition at the present time is good and he is again on his feet, after having had a right nephrectomy and spinal fusion, yet it is feared that time will reveal some other structure in which the tubercle bacilli have localized following the hematogenous dissemination which was first manifested by a tuberculous pleural effusion in the right chest.

In the treatment of tuberculous pleural effusions, the acute stage can be treated only symptomatically; the



Figure 2.
Case No. 4101

X-ray of same patient on Sanatorium admission 3-27-37, showing massive pleural effusion, right chest. Had this been the first X-ray on this patient's chest, there would have been no knowledge of an underlying parenchymal lesion. Therefore, the necessity of aspiration in these patients so as to permit detailed X-ray study of the underlying lung.

patient being in bed. The chest may be strapped with adhesive tape to relieve the pain. Sedatives are frequently required until actual fluid formation has occurred at which time the pain ceases. After the acute stage has subsided and the diagnosis of a tuberculous effusion has been definitely established, chest X-rays should be taken not only to ascertain the extent of the effusion but to see whether or not there is an underlying tuberculosis of the parenchyma of the lung. If an underlying tuberculosis is present, it has been the practice at the State Sanatorium to aspirate the fluid present and replace with air. This permits the establishment of a pneumothorax to control the tuberculosis in the underlying lung, and in some instances has apparently hastened the absorption of the effusion. After the disappearance of the effusion, pneumothorax is maintained for a period varying from three to five years depending upon the extent of the pulmonary tuberculosis originally present. An unsatisfactory pneumothorax is of course discontinued at an early date, and some other form of collapse therapy is instituted. The period which the patient spends on absolute bed rest depends upon his clinical condition and the improvement shown in the pulmonary tuberculosis by serial X-ray examination. In the case of massive effusions occupying an entire hemithorax or major portion thereof it is advisable to aspirate the effusion. Not only does aspiration relieve cardiorespiratory embarrassment and symptoms referable to the weight of the fluid against the stomach and liver, but if thoracentesis is supplemented by the injection of air and then a chest X-ray taken, the detail in the underlying lung which was previously obscured by the fluid can also be ascertained, thus revealing the presence or absence of parenchymal tuberculosis. Figures one, two, and three not only show



Figure 3.

Case No. 4101 - 6-28-37

Pneumothorax present. A small amount of fluid remains. Collapse of the right lung affords an adequate control of the underlying hilar tuberculosis. Sputum negative. Patient in good clinical condition.

the importance of the preceding statement, but also illustrate the fact that tuberculous pleural effusions are frequently secondary to tuberculosis in the underlying lung. If the underlying lung field does not show any infiltration, the air in the pleural cavity may be allowed to absorb. Frequently, with the absorption of the air, there is a rapid disappearance of the fluid as well as a return of the temperature to normal. Another reason for aspirating large effusions is that upon standing these accumulations of fluid tend to become purulent. The empyema alone is a serious complication. Equally important is the fact that the visceral pleura will have become thickened due to prolonged contact with the fluid with the result that the lung cannot be re-expanded, thus necessitating a thoracoplasty in order to clear up the empyema and to obliterate the pleural space. This is well-illustrated in the following case:

A. H. (File No. 4148) A 41-year-old female who was first admitted to the Sanatorium on 8-1-35. A massive serous pleural effusion, tuberculous in origin, was present in the right chest. This effusion was aspirated on repeated occasions. However, on 10-1-35, this patient left the Sanatorium against advice. Following her departure from the institution, she did not receive any medical treatment. Nothing further was heard from the patient until 4-27-37, when she applied for re-admission to the Sanatorium. The patient was re-admitted on 6-13-37, and at this time the X-ray showed the right hemithorax to be entirely opaque. The left lung was negative. The right pleural cavity was aspirated and a purulent fluid positive for tubercle bacilli was found. X-rays at this time showed an extensive thickening of the visceral pleura. (See figure 4) An attempt was made to re-expand the right lung by maintaining a constant negative pressure in the right pleural cavity. This was unsuccessful. A three-stage thoracoplasty was then done in order to obliterate the pleural



Figure 4.

A. H. (File No. 4148)

This plate taken after partial aspiration of the right pleural cavity shows the marked thickening of the pleura which occurs from the prolonged presence of an effusion. Arrows point to the thickening of the visceral pleura.

space. At the present time the patient is ready for discharge from the Sanatorium. Had this patient not left the Sanatorium against advice at an earlier date, and had the aspiration of the pleural effusion on the right side been continued, the right lung would have undoubtedly re-expanded, and the patient would have been saved the thoracoplasty.

Small pleural effusions which are evidenced by an opacity on the X-ray plate obscuring the costophrenic sinus are best left alone, because they usually clear of their own accord without any undesirable end results. This applies to all cases except those showing evidence of tuberculosis in the underlying lung. If such be present, pneumothorax should be instituted, because there will otherwise be a symphysis of the pleurae, preventing the establishment of pneumothorax which might be urgently needed at a later date. During the early stages of fluid formation, the amount of fluid formed is in some instances extremely large. The formation of this fluid can be limited to a certain extent by the administration of calcium gluconate grs. xv twice a day by mouth and by supplementing this with intravenous injections of 5 cc. of 10 per cent calcium chloride twice a week. The action of the calcium is purely in decreasing cell permeability, thus limiting the fluid formation. I cannot subscribe to the treatment which is occasionally practiced in which fluids are limited and mercurial diuretics are given intravenously. There is no rationale to this therapy in a tuberculous effusion. General supportive treatment of course is given. The anorexia present during the acute stage of the effusion often taxes the resources of the physician.

In the past, many methods of treating pleural effusions have been devised, ranging from the use of gold salts intravenously to the irrigation of the pleural cavity with an imposing array of chemical combinations. None of these treatments have been successful, but have proved to be very time-consuming to the physician and of no benefit to the patient. The important thing to remember in the treatment of tuberculous pleuritis with effusion is that rest is the all-important factor, and the patient should be treated as if there were an actual tuberculosis of the parenchyma of the lung, even though this may not exist. The mere fact that the fluid has absorbed and the patient is afebrile is not an indication that the disease has healed. I consider that six months of absolute rest in bed is the minimum for any patient with a tuberculous effusion. At the end of that period of time the patient should not present any evidence of activity of the disease. The patient should be afebrile; serial chest X-rays should not have shown any change in the underlying lung, and the sedimentation time and blood count should be within normal limits. I realize that it is sometimes trying for the family physician to keep such a patient who feels well in bed for this period of time. However, if this régime can be followed, fewer of these patients will return to him in the future with subsequent pulmonary tuberculosis or extra-pulmonary tuberculosis which may have developed.

Cases of simple pleural tuberculosis which are unaccompanied by tuberculosis of the lung, parenchyma, and which do not respond well to ordinary rest and dietetic treatment after a period of two months, may be benefited by ultra-violet irradiations.⁵ If a tuberculous empyema is formed, this will be found to be quite resistant to ultra-violet therapy.

While this paper does not deal with the management of tuberculous empyemas, yet I would like to insert the often repeated caution that these empyemas should not be treated by rib resection and open drainage. Repeated aspiration, irrigation with azochloramide, and if necessary, oleothorax, is the best management. Should a mixed infection empyema become manifest due to the development of a bronchial fistula, then open drainage is imperative.

Kallner⁶ has recently reviewed 690 cases of exudative pleurisy. It was found in this series of cases that between 24 and 28 per cent of the cases became ill or died from pulmonary tuberculosis. In the majority of these cases the active disease developed within the first five years. "The prognosis in the cases having a tubercular patient in the family was worse than that of patients without such a clinical history." The reason for this is obvious, in that an open case of tuberculosis in the family will give repeated exposure over a prolonged

period of time, and the individual would have an excellent opportunity to develop active pulmonary tuberculosis.

In the aforementioned series of cases, small exudates were found to offer a better prognosis than large ones. Likewise, the aspiration of an exudate did not effect the tuberculous morbidity. The presence of tubercle bacilli in the pleural fluid did not alter the prognosis. These findings correspond with my observations of cases of tuberculous pleural effusions at the State Sanatorium. Burrell⁷ gives the higher incidence of 40 per cent as the number of patients developing clinical pulmonary tuberculosis following a tuberculous pleural effusion.

From the preceding remarks concerning tuberculous pleuritis with effusion, it is readily seen that this manifestation of tuberculosis cannot be regarded lightly and it is my belief that the correct and early management of the disease will offer a certain degree of insurance against future tuberculous complications that are an undesirable end result.

Summary

1. Tuberculous infections of the pleura represent a re-infection type of tuberculosis and should be treated as such. The formation of fluid and the presence of tuberculosis of the pleura is an allergic manifestation of the host.

2. Large pleural effusions should be treated by repeated aspirations to prevent subsequent thickening of the visceral pleura and combat the tendencies these fluids show to empyema formation. Small pleural effusions, not accompanied by tuberculosis of the underlying lung, are best left alone, as they tend to resolve of their own accord.

3. All uncomplicated tuberculous pleural effusions should be treated by a minimum of six months of bed rest, in order to decrease the incidence of parenchymal tuberculosis which these patients show a definite tendency to develop.

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Rest and Collapse Therapy in the Treatment of Pulmonary Tuberculosis

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THE PRINCIPLES involved in the present-day treatment of pulmonary tuberculosis have been established within the memory of men still actively engaged in tuberculosis work, but so rapid has been the development of these principles, especially in the past decade or two, that it has been a difficult task for even those of us who devote our entire time to the handling of tuberculosis to keep pace with this advance. It is only sixty-two years since Peter Detweiler of Falkenstein, Germany, established his sanatorium, the first to be founded on the basis of rest as the fundamental principle in the treatment of pulmonary tuberculosis.

Pulmonary tuberculosis is a systemic disease and, as such, is accompanied by a depletion of systemic resistance and recuperative power. Rest—mental, emotional and physical—for a patient suffering from tuberculosis, exerts its influence not only on the local disease process in the lung by overcoming pulmonary tension and by slowing the circulation through the lung areas and so favoring the formation of fibrosis or healing, but it is the main factor in restoring that depleted systemic resistance and recuperative power, an essential factor on the cure of this disease.

Closely allied with rest in the treatment of tuberculosis is the education of the patient. This education is essential to the patient's understanding the importance of and the manner in which he must coöperate in carrying out the details of the "cure" so that he may secure all the advantages of rest.

While rest was recognized as the basic principle in the treatment of pulmonary tuberculosis, it became obvious that, in itself, it was inadequate to bring about the desired results in the great majority of patients as they presented themselves for treatment. In response to the demand for a supplement to rest in the care of these patients, interest in pneumothorax was stimulated. A few workers had been seriously experimenting with this form of treatment since 1870, but it was not until the water manometer had been introduced in the first decade of this century that the procedure received deep consideration. Even then it was to be twenty or twenty-five years more until pneumothorax began to claim the place it deserved in the treatment of pulmonary tuberculosis, more than half a century after Detweiler had founded his sanatorium based on the principle of rest.

Pneumothorax or compression and relaxation of the lung, when successfully established, enhances the influence of rest on the lung pathology in that it increases the tendency to the formation of fibrosis or healing and the localization of the disease process. In addition, it tends mechanically to bring the walls of cavities into

close apposition so that they can and will heal. Pneumothorax also reduces the general toxemia by reducing the circulation through the diseased areas of the lung.

While the introduction of pneumothorax as an auxiliary to rest in the treatment of pulmonary tuberculosis very definitely increased the number of patients whose disease was arrested, there still remained a large group of patients whose pulmonary condition could not be controlled by these agencies, principally because pleural adhesions and, to a less degree, pulmonary fibrosis, prevented sufficient collapse of the diseased areas, a situation brought about because of lack of early diagnosis or because of failure to induce pneumothorax in time to prevent extension of the disease or because the patient failed to present himself for treatment when his disease was in the earlier stage. Inasmuch as there were so many patients whose disease could not be controlled by rest and in whom successful collapse could not be secured by pneumothorax, attempts were made to devise other methods by which collapse could be produced. The outcome of these endeavors was the introduction of paravertebral thoracoplasty. This operation was done for the first time in 1911, and it was to be nearly a quarter-of-a-century before its value in the treatment of these cases of tuberculosis was to receive the appreciation it deserved. The technique of this procedure when it was first introduced, as well as the selection of the patient for the operation, were rather crude and quite different from what they are today. Present-day thoracoplasty is a highly specialized operation, done to an extent and with a technique to suit the individual patient.

Since the introduction of thoracoplasty there has followed the development of other less drastic operations, such as intrapleural pneumolysis and diaphragmatic paralysis by interruption of the phrenic nerve, as well as a number of other less frequently used special operations employed alone or in conjunction with other procedures to meet some of the more or less rare conditions. All told, we have at present about twelve different operations for the collapse or compression of tuberculous lungs. The most commonly used of these various operations are pneumothorax, pneumothorax accompanied by intrapleural pneumolysis, phrenic interruption and thoracoplasty. Temporary paralysis of the diaphragm by phrenic interruption is used quite frequently alone or in conjunction with pneumothorax and, less frequently, with thoracoplasty.

The development of collapse therapy during the past ten years, and especially during the past five years, is little short of phenomenal. Naturally, in the face of such rapid development in this form of treatment there is still a rather wide diversity of opinion as to the indica-

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tion for its uses, or at least there is a wide difference in the extent to which it is being used at the present time. A survey of the private and public sanatoria throughout the United States, carried out during 1936 and 1937 by the writer, showed that in the former, collapse therapy was used in an average of 34 per cent of the patients and in the latter, in 36 per cent of the patients. There were some sanatoria in each group in which no collapse was used. There were a few in which it was being used in from 80 per cent to 90 per cent of the patients. In only a little over one-third of the public sanatoria was this form of treatment used in 50 per cent or more of the patients.

The most enthusiastic supporters of collapse therapy tend to overlook the value of rest and would have us consider the treatment of tuberculosis as a surgical procedure, and there are those at the other extreme, who continue to treat their patients primarily by rest, using collapse therapy only in a small per cent of cases, if at all. The results obtained by careful workers indicate that, while this form of treatment should, in general, be used more extensively than it is being used at the present time, it should supplement rather than supplant the rest regimen. In the employment of mechanical therapy in the treatment of this disease, we must keep in mind the fact that the operation is done upon a patient who is already chronically sick. We must also bear in mind that the collapse resulting from mechanical therapy, while it may and usually does reduce the drain upon the vitality, does not heal the lesion. The healing takes place as the bodily resistance is restored, and rest is the fundamental factor in restoring this resistance. It is true that there are exceptional cases who will be able to overcome their disease as a result of collapse therapy alone. Such cases, however, are the exception and the risk in following such a course is too great where human life is involved. Where this course is followed, it cannot be considered more than a compromise because of economic conditions, and is not to be recommended if it can be avoided. On the other hand, failure or delay in the use of collapse therapy, when and if indicated, gives rise to a three-fold danger, first, the danger from the public health standpoint, second, the danger from the economic standpoint and, third, the danger from a clinical standpoint.

When a patient is treated in an institution where efficient sanitary control is carried out, there is very little danger from the standpoint of public health, but if a patient with positive sputum is treated under conditions where such control is not possible, as is the case in most homes, or if the patient is allowed to leave the institution and return home while his sputum still contains the bacilli, we then have a very serious public health hazard. Under such conditions, the patient is likely not only to impart a very serious re-infection to those whom he has already infected, but also to give new infection to others. Present-day collapse therapy, inasmuch as it will convert a large per cent of these cases from positive to negative, does much to obviate this danger.

From an economic standpoint, since intelligent collapse therapy will, in general, shorten the period of necessary inactivity, it is of material benefit to patients both public and private. The majority of patients with tuberculosis find it necessary to take the "cure" in public institutions. Many of these institutions are not only filled to capacity, but have long waiting lists. Consequently, the period during which a patient can remain in such a sanatorium is more or less limited. By the use of collapse therapy, where it is indicated, as a supplement to the rest regimen, these patients will not only stand a much better chance to gain control of their disease while in the institution, but a certain per cent of them will be in a condition to safely leave the institution before their allotted time expires. Likewise, collapse therapy used as indicated in the case of those who are cared for as private patients will give these individuals who have limited finances or who are dependent upon friends or relatives for their care a better chance to gain control of their tuberculosis before economic conditions compel them to abandon the "cure".

The danger, from a clinical standpoint, resulting from a failure or delay in the use of collapse therapy is, primarily, the extension of the disease and the difficulties which arise from this extension.

In a sense, the treatment of pulmonary tuberculosis is a progressive procedure. If the disease is discovered in its early stage, every effort should be made to forestall its development by beginning with the simpler methods of treatment and employing the more drastic ones only as necessity requires. It has been found that from 80 per cent to 90 per cent of the early or minimal cases will recover on a strict rest cure. In practice, however, unfortunately, even in institutions dealing only with early cases, only a small proportion of those patients who present themselves for treatment are really in the minimal stage.

If we have an opportunity to treat the patient while his disease is in the early stage, the logical procedure is to try the rest regimen first, unless there is some special indication, such as a severe hemorrhage, that collapse therapy should be instituted at once. This is regarded as the logical course, inasmuch as it will enable a large majority of these patients to overcome their disease, and collapse therapy, even in its simpler forms, is not entirely without the possibility of some handicap or danger. In following this course, the patient should be carefully watched. There is no set rule to follow and each case must be judged upon its own merits. X-rays of the chest should be taken frequently, perhaps from every ten to thirty days, depending upon the individual circumstances, and if at the end of eight or ten weeks the disease does not show signs of retrogression or if at any time during that period the disease should show signs of progress, collapse therapy should be instituted. In this type of case, only the simpler forms of collapse therapy are indicated. As a rule, pneumothorax should be tried first. There are certain cases, however, particularly where there is evidence of fibrosis and pulmonary contraction and especially if the lesion is sub-apical, in

which temporary paralysis of the diaphragm may be tried first. This is a simple procedure, not ordinarily accompanied by any untoward results, and takes only a few minutes to perform and may control the disease, while pneumothorax is not without its dangers, relatively few as they are, and frequent refills are necessary and the procedure must be continued over a comparatively long period.

If pneumothorax is used alone or in conjunction with phrenic interruption and collapse therapy is rendered unsuccessful by pleural adhesions, too much time should not be wasted. As a rule, it is a mistake to wait more than two or three months before an effort is made to determine whether or not these adhesions can be severed by intrapleural pneumolysis.

As pulmonary tuberculosis develops from the early to more advanced stages, the picture changes. Recovery through rest alone grows less possible, the time required for treatment longer, and the final results more unfavorable. However, if the lesions are not too far advanced and tend to be of the proliferative type and the patient is more or less stabilized and there are no cavities present, there is still a fair possibility of recovery on the rest regimen. But if it is not definitely indicated, as determined by X-ray and clinical examinations, that the patient is able to handle his disease by this means, after a period of from six to eight weeks, mechanical aid should be applied. In 'teen-age patients with this stage of involvement, owing to the marked tendency for the disease to progress in these patients, collapse therapy should be tried at once. Many workers feel that during this age period, even in the early cases, collapse therapy should be instituted as soon as the diagnosis is made. With the above type of disease, when the patient is beyond the 'teen-age and where a small cavity is present, there is still considerable difference of opinion as to what procedure to follow. Cavities, perhaps not to exceed two or three centimeters in diameter, that are not surrounded by dense fibrosis, do undergo spontaneous recovery and some workers prefer to give them an opportunity to do so. Due to danger of spread of the infection within the lungs or to other parts of the body and to serious hemorrhage and because of the danger of the formation of pleural adhesions, the safest course is to institute collapse therapy at once where a definite cavity is demonstrated, regardless of the stage of the disease.

In the moderately-advanced case that has predominantly the exudative type of disease, we are dealing with a different picture. Acute toxic infection is present in which the immuno-biological balance of the patient is seriously disturbed and the disease process may go rapidly either way. It is possible that the patient will become stabilized and the lesion will undergo resolution. On the other hand, if the lesion tends to progress, caseation with excavation may quickly follow. Moreover, there is serious danger of the rapid occurrence of extensive pleural adhesions, which would make the simpler forms of collapse therapy impossible or useless, and the more radical forms of surgery are contraindicated in this

type of lesion. Consequently, when this type of lesion is encountered, the simpler forms of collapse therapy should be tried at the beginning whether or not a cavity is present.

As the pulmonary condition tends toward the advanced stage, due to the decrease in the likelihood of controlling the disease by rest and the possibility of the formation of extensive adhesions and the development of other complications, if the condition permits the use of collapse therapy, the type which may be indicated should be used at the outset.

As the lesions vary in the amount of fibrosis or exudation present, the course to pursue must be determined by those in charge. With bilateral lesions, the same principles as described above, in general, should be followed. If collapse therapy is to be used in both lungs, with pneumothorax as a factor, it is imperative that selective collapse be obtained. The earlier the attempt is made, the more likely it is to be accomplished.

If, through rest and the employment of the simpler methods of collapse therapy, used either singly or in combination as may be indicated, we are not able to overcome these acute types of disease, a situation arises which requires careful clinical judgment. Where the disease is still clinically active or the resistance of the patient is low, thoracoplasty is contraindicated. Occasionally, in such cases, some of the more rarely used special forms of collapse therapy may be employed with benefit. On the other hand, it may be necessary for us to be content with the hope of holding the disease in abeyance and of building up the resistance and eventually overcoming the activity of the process by rest and the simpler collapse procedures so that more radical surgery can be safely performed later. The course to pursue with patients of this type should be determined by the physician, who is not only familiar with the patient's disease but with the patient himself, working in conjunction with the chest surgeon, who is experienced in this special field and is able to understand the possible surgical endurance of the patient.

A relatively prolonged period of bed rest in order to build up the patient's resistance and overcome any clinical activity of the disease is essential to the more radical forms of collapse therapy. However, once the patient has reached the position where such surgical interference is indicated and is possible, the surgery should be done. Continued rest for these patients without the assistance of collapse therapy is not only wasting time, but inviting certain complications such as:

1. Bronchogenic and hemotogenous extensions of the disease and, in the less fibrotic cases, increase in the size of cavity, and the occurrence of hemorrhage.
2. Where lesions are predominantly fibrotic in type, the walls of the cavities as well as the lung tissue around them may become so dense that closing them satisfactorily is difficult or impossible by any procedure.
3. The fibrosis of the lung may increase and involve more or less the whole lung as well as the

pleura, resulting in a marked contraction with displacement of the vertebrae, creating a defective posture and very often distressing pain.

4. In the presence of dense fibrosis, kinking and distortion of the bronchi take place, resulting in retention of purulent secretions.

Patients who have gone through such a neglected period, even if they are later subjected to collapse therapy, are far from being well individuals. Because of the retention of pus, they are in a chronic state of toxemia and developing amyloidosis and because of their discomfort, they are mentally depressed and discouraged. There is also a marked reduction of their vital and working capacity and they have a definitely limited

endurance and fall easy prey to the acute respiratory infections. While collapse therapy may prolong the lives of some of them and enable them to return to a certain degree of economic usefulness, few of them are other than chronic invalids and many of them still have a sputum that contains tubercle bacilli.

In conclusion, rest, intensive and prolonged, is an important factor in the treatment of pulmonary tuberculosis. By this means alone, a certain proportion of patients are able to regain their health. It is necessary, however, to supplement the rest regimen by collapse therapy of some type in approximately two-thirds or more of tuberculous patients as they present themselves for treatment at the present time, not only to save their lives, but to secure satisfactory end-results.

Tuberculosis Work in South Dakota

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TUBERCULOSIS lacks the respect due it. That it is a contagious disease no one denies. That contact with tuberculosis causes infection everyone knows. That the germs are spread through discharges through the mouth is common knowledge. Yet very little fuss is created when a known tuberculous person tours the streets. Why does the general public have such a lethargic attitude toward this great menace? It is easy to say it is because of the lack of education of the general public. That perhaps is true. It is not the so-called illiterate who holds back this educational program. It is the refusal of supposedly intelligent and educated individuals to accept what might be inconvenient for their personal activities, that retards progress.

When the South Dakota Board of Health passed a law requiring all teachers to be Mantoux-tested, a great howl went up because of "special legislation against a special group." Some of these supposedly educated individuals accused the medical profession of legislation against teachers for their own aggrandizement. This of course is ignorance, pure and simple, no matter what degrees these teachers hold. So much fuss was made that this simple request, which was so great a step toward the control of tuberculosis in the state, was practically sabotaged. It was thereafter ruled that the tests should be made if the school board requested—the cost to be carried by said board. The effect was practically the same as if the law had been repealed. A study by Dr. Lees in Philadelphia shows that probably one teacher in 46 in our secondary schools has active tuberculosis. Parents should demand that they be shown that all teachers are free from disease before they send their children to school.

I believe that more intensive education, especially in some states, is needed. Instead of the National Tuberculosis Association's thinking of spreading out its activi-

ties and spending its money on heart disease; *etc.*, it should concentrate its finances and efforts in those states where the tuberculosis program is not well along. The gradual decrease in death and morbidity from tuberculosis has slowed down and almost stopped; I believe part of that is due to the strenuous times these past few years and part to a let-up in the tuberculosis program.

We, as physicians, are far from perfect. Tuberculosis is a disease that is poorly understood by a great many physicians. In past generations, tuberculosis was considered something you got or you did not, and likewise it was something you overcame or you did not. It was a cause for invalidism—an invalidism causing great solicitous expressions from adults and children. A rough outdoor life was the thing—or maybe the whole family moved to New Mexico and continued to live in close contact with the afflicted one. It was too bad, then, that little Johnnie seemed to have the same weakness that afflicted Uncle John.

Too much of this same attitude remains in the subconscious mind of the laity and the profession. Let us not place all the blame on the public for continued tuberculosis ravages. The treatment and knowledge of the disease has developed faster than the education of the general practitioner. There is a definite reason for that, and it cannot be charged wholly to the individual physician. There have been more startling and dramatic discoveries concerning other diseases that have been adopted by the general physician as soon as, or sooner, than by specialists. The very reason for that, of course, is that treatment has been by medicine. Although many physicians do not appreciate it, the pharmaceutical detail men are their chief source of post-graduate study. By word-of-mouth information, and by pamphlet, the indications, contraindications and all effects of a new product are made known. By virtue of this constant education, the average physician is kept up-to-date on

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progress on most of the diseases. If someone were to discover a medicine that would definitely influence tuberculosis for the good, the knowledge of tuberculosis among the profession would soon be increased many times over—the detail men would see to that.

The only way to obtain a great deal of working knowledge about tuberculosis is to work with it. This, of course, is almost impossible for the busy practitioner—or is it? Why does any physician tell a patient to go to the sanatorium for a couple of weeks or six weeks and that he will then be O. K., when that patient has a far-advanced tuberculosis that will take many years and perhaps extensive surgery to control? Why is it 90 per cent of all entrants to the sanatoria are far-advanced? Why is it that their history shows that they have had a cough for a year—2 years—5 years—with not one X-ray of the chest? Why is it that patient after patient will have the flu without getting well after six to eight weeks or six to eight months, and never have a chest examination or X-ray? Why is it that a patient with a chronic cough will go to doctor after doctor to find out the trouble, and be treated for bronchitis or sinusitis without ever securing an X-ray of the chest or sputum examination, even when the patient suggests it? Why is it that patients come to the sanatorium after such experiences with their condition finally discovered by an irregular practitioner who had the common sense to have the sputum examined? It is because the general practitioner has not interested himself in this disease, and knows very little about it. We must stop considering tuberculosis as a slow, gradual process. We must not wait for fever, cough and loss of weight, for then we will have a disease in a far-advanced stage. Râles are a poor index to activity. We should push the symptoms of cough and emaciation from our minds, so that we do not rely on them too much for diagnosis. If we wait for cough, we diagnose only far-advanced cases. Physical examination without X-ray is useless in diagnosing early tuberculosis.

Here we have a disease that in the last thirty years has taken three-and-one-half million men, women and children from the United States—which causes three-fourths of a billion dollars' annual loss of wealth in the United States; yet it seems we cannot get very excited about it! The question is, of course, how can we overcome the attitude of the general public toward this disease? Here in South Dakota, the tuberculosis program of education can be increased greatly. The South Dakota Public Health Association has done much help, and is almost wholly responsible for what education is received in this state. Where does this state stand in efficiency of program? Where thorough case-finding programs are conducted, it has been estimated that there should be found two new cases for every death from tuberculosis. If that be a good criterion in South Dakota, we have a 28.8 per cent efficient program. In 1936, there were reported to the State Board of Health, 251 deaths attributed to tuberculosis. In that same year, only 145 new cases were reported. There should have been 502 cases reported instead of 145, if the normal ratio of 2 new

cases to every death is an accurate criterion. Either tuberculosis as a disease cannot be recognized, or there is a laxity in reporting this disease to the State Board of Health. I believe there is a little of both reasons for this discrepancy. I believe that the chief cause for finding tuberculosis in its advanced stages only, in 80 per cent or 90 per cent of the cases, is that we think too much about tuberculosis as a chronic disease, with emaciation and cough as its only symptoms. It is not generally remembered that it may be an acute disease, developing rapidly with great toxemia, chills and fever, not unlike influenza and many other acute diseases. If every diagnosis of flu were followed with an X-ray, many acute cases of tuberculosis would be uncovered. What would be the attitude of the public and the State Board of Health if we waited until diphtheria were far-advanced before we made a diagnosis in four out of five cases? That is what we are doing with tuberculosis, and it is much easier to control far-advanced diphtheria than far-advanced tuberculosis.

In the South Dakota State Sanatorium, there were up to January 1, 1937, 3,451 admissions, of which 427 were classified as incipient. In other words, 87.7 per cent of all cases seeking admission to the Sanatorium have been advanced stages. Following is a tabulation of statistics on tuberculosis, as taken from the South Dakota State Board of Health. The first three columns give the statistics received from this board, the fourth column represents approximately the number of new cases which should have been found and reported to the State Board of Health, if we had been maintaining an efficient case-finding program in South Dakota.

TABLE I.
Tuberculosis
Reported to State Board of Health—South Dakota

Year	Cases	Deaths	Estimated Cases Which Should Have Been Reported
1913	34	276	652
1914	92	288	576
1915	117	319	638
1916	91	267	534
1917	35	292	584
1918	96	307	614
1919	140	273	546
1920	215	273	546
1921	299	267	534
1922	380	303	606
1923	237	373	746
1924	159	202	404
1925	124	375	750
1926	91	397	794
1927	85	342	684
1928	78	450	900
1929	68	373	746
1930	124	346	692
1931	175	307	614
1932	171	311	622
1933	118	286	572
1934	180	248	496
1935	250	273	546
1936	145	251	502

In 1913, with 276 deaths, only 34 new cases were reported to the State Board of Health. An efficient program would have reported 652 cases. That figure can be excused on the grounds that reporting was a new thing. Going down along the line, we see that the only years when new cases reported were more than deaths reported were 1921 and 1922. Were doctors keener in 1921 and 1922? Was there more tuberculosis? Or was

there some other reason for this surge forward in reporting cases? We find that in those years, considerable trouble was taken to estimate the number of tuberculosis cases in the state, for we were asking for new buildings at the Sanatorium. I think that is the only reason why we now find this increased case-reporting in those years. If we now have an inaccurate case-finding program, two things are at fault: we are not recognizing tuberculosis as we should, and we are not reporting it when it is recognized.

In order to more fully acquaint the entire population, profession and laity, with tuberculosis and its care, education is needed. This program of education, I believe is the direct responsibility of the South Dakota State Board of Health and the State Public Health Association. The State Board of Health should consider tuberculosis as it considers any other disease, and should take definite and firm steps toward its control. A few years ago, people thought nothing of going into houses and exposing themselves to scarlet fever and diphtheria. The State Board of Health has educated the people out of that carelessness pretty well. Only recently have they stressed pneumonia as being contagious. Tuberculosis certainly should receive as much recognition.

In South Dakota, it will be necessary to recognize that the State Sanatorium is not the whole tuberculosis program—it is in fact a minor part of it. There are beds for about 200 patients at the Sanatorium and about 83.7 per cent of these beds are filled with moderately or far-advanced patients. On many of these no active treatment can be used successfully. We do not consider that these cases rightfully belong here. There are hundreds of early cases of tuberculosis throughout the state who do belong here, however, if they could be found. How can they be found? South Dakota has not such a large population, and all the cases in the state could be found if a systematic case-finding program were installed. There is no reason why we could not aim for a tuberculous-free state, just as the veterinarians do. One county in Nebraska is aiming at such a goal. The veterinarians have it all over us in the tuberculosis program. They take no chances. All reactors are called tuberculous and are dealt with accordingly. However, I do not recommend to our program their method of dealing.

We are, however, so afraid of offending that even after we find a positive Mantoux, most of the time we minimize it and say, "Oh, that does not mean anything."

We should stress that it means that infection has taken place, and that there is a chance of about one out of every five, developing active tuberculosis in the future. We should advise yearly X-rays (good ones) for all reactors. We should consider them all active until proved otherwise, if we expect to get anywhere in our case-finding program. If every man, woman and child in the state were to be given the Mantoux test, a great majority of tuberculosis cases would be picked up. If all negative reactors were retested each year, we would keep our program up to date. You might say it is too expensive to X-ray all these people, but it wouldn't cost

anywhere near the annual loss in wealth caused by tuberculosis in the state. Where large groups are X-rayed, paper films would pick up the greater proportion of active cases, and when in doubt the regular film would diagnose most of those remaining. If properly organized, X-ray clinics could be conducted at \$1.00 to \$1.50 a film, if the paper films were used.

Some of the organizations that have gone into health work for the publicity it gives them might get more actual value for their dollars if they bought a mobile X-ray unit, hired a good technician, and did a state-wide chest X-ray survey, after making arrangements with an X-ray diagnostician to interpret these films. I am sure it would be of as much value as half-finished immunization flurries and other programs which properly should be left to the medical professions.

In South Dakota, at least, sanatorium care of tuberculosis has not been adequate. No definite follow-up program has been established. I have tabulated below data on eighteen patients readmitted to the Sanatorium who had been discharged previously as quiescent, apparently arrested, or arrested and cured. In the first column we list the condition on discharge, the second column the length of residence, the third column, the length of absence from the institution until readmitted as active cases.

TABLE II.

Condition on Discharge	Length of First Residence	Length of Absence
Cured	8 months	8 mos. 16 days
Arrested	1 yr. 2 mos.	8 mos. 10 days
Arrested	1 yr. 4 mos. 6 days	1 yr. 6 mos. 4 days
Average	1 yr. 3 mos. 13 days	1 yr. 1 mo. 7 days
Apparently Arrested	6 mos. 1 day	5 yrs. 5 mos. 2 days
	2 yrs. 8 mos. 10 days	4 mos.
	7 mos. 23 days	1 mo. 3 days
	1 yr. 8 mos. 5 days	4 mos. 9 days
	1 yr. 10 days	1 yr. 9 mos. 12 days
	1 yr. 6 mos. 4 days	11 mos. 10 days
	3 yrs. 9 mos. 30 days	3 yrs. 2 mos. 5 days
	4 yrs. 1 mo. 23 days	2 mos. 20 days
Average	2 yrs. 2 days	1 yr. 3 mos. 29 days
QUIESCENT	9 mos. 5 days	27 days
	2 yrs. 11 mos. 11 days	7 mos. 13 days
	9 mos. 2 days	4 mos. 25 days
	1 yr. 9 mos. 24 days	7 mos. 2 days
	8 mos. 7 days	1 yr. 16 days
	1 yr. 6 mos. 20 days	4 yrs. 1 mo. 10 days
	3 yrs. 7 mos. 23 days	1 yr. 6 mos. 19 days
Average	1 yr. 8 mos. 26 days	1 yr. 2 mos. 12 days

These figures indicate two facts; first, many of these patients were not adequately healed before being sent out; second, adequate provision for their care after being discharged was not provided. Possibly the second fact has more to do with repeaters than the first one. No patients have been included in this study except those who were at least quiescent in their disease. Many of the cases who left while active, for some reason or other are repeaters, but have not been included in this study. There is need for a change in classification of state of progress of disease, not admitting quiescent or apparently arrested cases to discharge, but discharging only arrested and cured cases. The only difference would be in not allowing the quiescent or apparently arrested to

get out of our supervision until they had arrived at the cured or arrested stage. This should properly be the function of the Sanatorium, but accomplished through a follow-up organization. This should be done. Besides the above, proper arrangements for after-care of these cases should be established. The indigent tuberculous should have a home to which he might go and help care for himself until fit to do labor which is self-supporting. Not until such an arrangement is made will we be able to look ahead to a country free from tuberculosis.

A thorough study of tuberculosis conditions in South Dakota would fill a good-size column. There has been no effort made in this paper to minutely analyze the situation; however, I hope that the few points brought out will have served the purpose of stimulating organizations (professional and voluntary) to exert more efforts

in finding tuberculosis in South Dakota and toward positively controlling the same.

Conclusions

1. Tuberculosis is still poorly understood.
2. Further education of both profession and laity is needed in South Dakota.
3. More information on tuberculosis in South Dakota needs to be obtained.
4. Adequate case-finding program should be instituted to obtain information.
5. When information is found, coördination of all public health and philanthropic agencies should be made to control tuberculosis.
6. Extension of the sanatorium after-care program is needed.

Anti-Tuberculosis Work at the Flandreau Indian School*

A. S. Rider, M.D., F.A.C.S.†

Flandreau, South Dakota

I FEEL very much out of character in discussing any phase of tuberculosis before such a group as this, made up, as it is, of masters in its prevention. However, your associate and my valued and helpful friend, Dr. Myers, has invited me here to tell you something about our anti-tuberculosis work at the Flandreau Indian School. While I cannot hope to tell you much about tuberculosis, perhaps I may bring some information regarding Indians that you may find of interest and therefore, not be too much of a disappointment either to you or to my sponsor.

The school is located on the big bend of the Sioux River. The site has a history going back to the year 1663, when a large Omaha Indian town was located there. A Hudson Bay post was established in 1763, but was soon abandoned. La Framboise had a post from 1823 to 1827 on the big bend. In 1857, a town site was laid out by the Dakota Land Company and a post was established. It was sacked and burned by the Indians in 1858, together with the now vanished town of Medary, which was then located 15 miles north of Flandreau. Little Crow's war party, returning from their Spirit Lake raid, crossed the Sioux River here in 1862, and drowned a Mrs. Thatcher while crossing.

A band of Dakota Indians, consisting of 25 families from the Santee agency, came here and took up homesteads in 1862. They left the agency against the wishes of their tribal chief and the Indian agent. Among them were Indians who had been prisoners as a result of the New Ulm outbreak. They walked 100 miles, carrying their goods upon their backs.

The Flandreau Vocational Indian High School had its beginning as a mission school among these Indians.

* Presented before the medical staff of the Lymanhurst Health Center, Minneapolis, Minnesota, February 25, 1938.

† Physician, Flandreau Indian School.

It was started as a government school in 1873 in an old church building. Some of the first pupils are still alive and are living near Flandreau.

In 1893, the school was organized as a boarding school for Indian children and continued to give instruction to the intermediary grades until 1932.

In 1932, under the leadership of the present superintendent, the program was centered upon vocational training. Applicants for admission must now have at least one year high school and must be physically, mentally and morally fitted to receive and make subsequent use of industrial training. The superintendent determines who is to be admitted.

The boys and girls who attend this school are, therefore, a select group and do not represent an average cross-section of Indian youth. The ages are from 17 to 22, an age group, as you well know, in which tuberculosis is an important problem. It is especially so among Indians, as their death rate from tuberculosis is about seven times that of the white population.

The opportunity to put into operation modern methods of anti-tuberculosis work in this school is due to the support and coöperation of a professionally-minded superintendent, and to the highly sympathetic attitude of the commissioner of Indian affairs.

Although of a different political party, I must, in all fairness, testify that in my opinion the administration of Indian affairs is now at its highest level of efficiency and consideration for the Indian.

That the new program is justified is demonstrated by the fact that from an average attendance of about 430 per annum, about 270 boys and girls have gone to good jobs during the past three years. In the school years of 1936 and 1937, 60 boys and 37 girls obtained jobs,

most of which required technical training. Industrial training is expensive. Supplies and shop equipment cost money. The annual average cost is about \$335 per student. It is, therefore, essential for economic as well as humanitarian reasons that the student be physically able to receive training and make subsequent use of it. Table I gives the results of our first survey. In 1936, 443 students were enrolled—216 girls, 227 boys. Routine Mantoux tests were given, using old tuberculin.

TABLE I.
Mantoux Tests, 1936. O. T.

Boys	227	58—	169	74%
Girls	216	69—	147	68%
Total	443	127—	316	70%

All the positives, 316 in number, were X-rayed. Dr. Myers kindly checked our films. The results are given in Table II.

TABLE II.

Chest rays taken:			
Boys	169	66—	103
Girls	147	46—	101
Calcification			145
Pleural changes			10
Cervical rib, otherwise negative			1
Anomaly 4th left rib, otherwise negative			2
Infiltrations and densities (re-infection type)...			21
Cavitation			1
Cardiac enlargement, otherwise negative			2
Changes not classified, such as enlarged hilus, increased bronchovascular markings, etc.			22

One hundred twelve were negative, 145 showed calcification, 22 showed changes that suggested re-infection type tuberculosis, 10 cases showed pleural changes such as thickening, adhesions and in 4 cases, small amounts of fluid. Cases with suggestive shadows were studied in detail. They were hospitalized, temperature and weight curves noted, complete blood, urine and repeated sputum examinations were made. Repeated chest examinations were made, and unless conclusions were reached, they were re-read at periods of 3, 6 and 12 months later. As a result:

TABLE III.

Re-infection group:		
Cases considered active		12
Cases considered arrested		10
(No clinical signs, and rays taken after 6 to 12 months show no progression.)		
Cases active transferred to sanatorium		6
Cases active at home or not known		6
Cases arrested here at school		8
Cases arrested at home or unknown		2
443 students	22 cases	5%
443 students	12 active cases	3%

There were 3 active cases that hemorrhaged before being transferred. One case had far-advanced disease, one entire lung and one-half of the other involved. There were 3 cases with positive sputum and 4 cases presented clinical data sufficient for diagnosis without X-ray. These active cases were disposed of by transferring 6 to government sanatoria; 6 were sent home. Where cases are sent home, the parents and the superintendents of their agencies are notified immediately of their condition and it is quite likely that most of them are in sanatoria.

With a school attendance of 443, of ages 17 to 21, 12 cases of active re-infection type tuberculosis were found. Twelve cases among 443 students is a little less than 3 per cent. One of the active cases had far-advanced disease, the whole of one lung and large part of the other affected. In spite of this, he was able to be recommended for admission to the school. A sister, who was also in school, had a negative Mantoux reaction. However, owing to her intimate contact, she was X-rayed. Active re-infection type tuberculosis was found. This is not an argument against the dependability of the Mantoux reaction, but serves to emphasize the necessity of a complete study of cases where such intimate contact occurs. Four of the cases placed in sanatoria are reported as doing well while in two, the disease is advancing. Definite history of contact was obtained in 45 cases. It is difficult to obtain a reliable history. It is safe to assume that most Indian youth, of high school age, have been in contact with tuberculosis. One who has seen the conditions under which they live will understand this. Families of six or more may be found living in one or two rooms, one or two windows may be the sole means of ventilation, and perhaps there is only one outside door. Dirt floors are not uncommon. While some Indian families have good homes, they are a decided exception rather than the rule. The high incidence of positive Mantoux reactions is to be expected when one considers the surroundings of these young people during their early lives. In the fall of 1937, Mantoux tests were made on an enrollment of 436 students, 216 girls and 220 boys.

TABLE IV.
Mantoux Tests, 1937. P. P. D.

Girls	154	1st test	104—	50
Girls	104	2nd test	72—	32
Girls positive from last year				62
Total			72—	144
Enrollment, girls	216		72—	144
Girls negative last year, and positive this year				66% + 18
Boys	159	1st test	110	49
Boys	110	2nd test	62	48
Boys positive from last year				61
Total			62—	158
Enrollment, boys	220		72—	158
Boys negative last year, but positive this year				70% + 18
Total	436	134—	302+	69% +

X-ray and other studies have not been completed on this group; however, 5 active cases have been discovered, 2 of whom have been sent home. One died in hospital here. Two are in the hospital awaiting transfer to sanatoria. Purified protein derivative was used. The use of P. P. D. is required now through the entire Indian service in order to standardize technique. One hundred fifty-four girls were tested, the balance being positives last year. Eighty-two were positive, and 18 who were negative last year were positive this year. One hundred fifty-nine boys were tested, the remainder being positives from last year. Eighteen were positive who were negative last year. We do not know whether the 36 positive cases this year who were negative last year are due to the use of the P. P. D., or to the fact that second tests were made this year while only one was made last year, or whether they represent subsequent infection. Girls

giving positive reactions were 144 out of a group of 216, or a little more than 66 per cent +. Male positive cases are 158 out of a group of 220, or a little more than 70 per cent. These figures are slightly less than those of last year. We received 267 new students this year; 99 of whom were positive on the first test, and 79 on the re-check, with the second dilution. That is, of 267 new students, 178 were positive — 66 per cent.

This experience would seem to indicate that the first dilution of P. P. D. gives a somewhat lower percentage of positive results than are obtained with O. T. The lower percentage of 66 per cent + positives this year as compared with 70 per cent last year with a single test of O. T. would suggest either a lower percentage of infected students, or a less effective method of testing.

The health story of the Indian, like that of the white, has been influenced by his economic and social history.

The researches of Ashburn and Hrdlicka support the belief that before the coming of the white man, the Indian who survived adolescence died usually from violence, famine, or old age. He was free from most of the diseases from which he now suffers. Digestive diseases of childhood took a heavy toll. Their death rate now, from these disorders, is twice that of the whites. Among older Indians, pneumonia, arthritis and bony tumors occurred.

Explorers, white colonists and African slaves, brought the infectious diseases to them. They spread rapidly because the Indians had no acquired immunity. Tuberculosis is probably one of the white man's gifts to the Indian. There is no evidence that it existed before his coming. Today, the Indian has about the same diseases as his white neighbor. His low standard of living (the lowest in America), extreme poverty, ignorance and lack of acquired immunity, make his health problems difficult. Digestive disorders of childhood, tuberculosis and trachoma, are his principal enemies. Rheumatic fever, small-pox (when unprotected), malaria, dysentery, find in him an easy victim. However, he does have certain advantages. Compared to the whites, he suffers relatively less frequently from the anemias, diseases of the breast, diseases of the liver, diseases of the female genitalia, cancer, rickets, insanity, nervous disorder, scarlet fever, diabetes, and bone fracture. Contrary to the common belief, I have found but little evidence of syphilis among our Indians. The principal reason for the Indian's relative immunity from many of the white man's diseases is to be found, in my opinion, in his formerly very high and still relatively high childhood and adolescent mortality. The physically sub-standard Indian had a very poor chance of reaching maturity and of perpetuating his kind.

There are about 320,000 Indians in the United States, and about 30,000 in Alaska. In spite of handicaps, our

Indians are increasing both absolutely and relatively. There are about 3,500 more births than deaths per annum. Full bloods are increasing about 1.6 per cent per annum.

Our government, thus far, has never developed a fixed policy towards the Indian. One policy is that of *laissez faire*, and contemplates permitting them to merge with the general public, and to lose their identity. The other is based on the idea that the Indian should develop as an Indian, in keeping with his traditions and inclinations.

In practice, governmental treatment varies between these two extremes, and is not the same in different localities, but represents all degrees of compromise between these two points of view. From a medical standpoint, Indians are charity patients of the government, or beneficiaries of treaty rights.

The history of the Indian health service is one of increasing scope and responsibility. On June 30th, 1934, there were 15 tuberculosis sanatoria with 1,315 beds available. Substantial additions have been made since that date. The ratio of hospital beds for tuberculosis among the Indians is now about 620 to 100,000. Sanatorium treatment offers about the only chance of successful treatment of Indian tuberculars because of their home conditions. The *per capita* cost of Indian sanatoria is about \$2.50 a day. You may find the following tables interesting. It is striking to note that the ratio of insanity as compared to whites is about 1 to 20.

TABLE V.
Births and Deaths. Rates per 1,000

	Indians		Whites	
	Births	Deaths	Births	Deaths
1928 ..	28.5	21.8	19.8	12.1
1929 ..	32.7	28.3	18.0	11.9
1930 ..	27.1	19.9	18.9	13.3
1931 ..	21.5	16.0	17.8	11.1
1932 ..	21.4	14.3	17.4	10.9
1933 ..	23.8	15.5	16.6	10.7
1936 ..	22.3	13.7	16.6	11.5

TABLE VI.

	1929	1930	1931	1932	1933
Tuberculosis	5,260	5,174	5,037	4,411	4,497
Scarlet Fever	58	67	95	94	51
Septicemia	?	?	?	?	60
Measles	1,350	1,708	1,439	751	2,692
Whooping Cough	1,978	1,069	883	962	925

TABLE VII.

Indian Hospital Days per 100,000 for Tuberculosis and Insanity

	Indian	Whites	C.C.M.C.*
Tuberculosis	132,036	17,591	46,910
Insane	10,417	137,878	189,862

Indian Sanatoria for Tuberculosis—1934

Number—15 Beds—1,315

Rating of beds—620 to 100,000.

*C.C.M.C. estimate need, or 138 to 100,000 general population.

* Committee on the Cost of Medical Care.

Reminiscences of Tuberculosis Control Work in Montana

C. E. K. Vidal, M.D.

Troy, Montana

THE EDITORS of this journal were kind enough to ask for a short paper of reminiscences of Montana medicine with special reference to tuberculosis.

These memories go back for almost half a century. If a backward glance is taken to 1891, the year of the writer's arrival in the state, one is tempted to a comparison between medicine past and medicine present; for the year given marks the early stage of an era when our profession began to flux and great things were beginning to happen. The word "beginning" is used advisedly for, according to modern standards, we were surely singularly lacking. The X-ray waited round the corner; we only dreamed of a mechanism that would enable us to see bony structures, let alone visualize lung cavities and pleural adhesions. Hematology was in its infancy. The differential count, that splendid crutch on which to lean in the presence of infections, was not for us. Blood transfusion, instead of being a commonplace, was a deep and dark mystery, with a knowledge of typing yet to come. Diphtheria ranked among the captains of the men of death, with antitoxin several years away. Its mortality was high and the helplessness of the doctor in the face of an epidemic was tragic. The abdominal cavity was still, to a great extent, *terra incognita*. One dived into its depths with fear and trembling. The era of inflammation of the bowels had just passed and the appendix had found recognition as the frequent villain of the piece, but how and when to remove the aforesaid villain was a subject intensely controversial. Operation room technic was unsettled and unstable. The rubber glove had not yet come into general use. The carbolic spray had just gone up to the attic. Asepsis and antisepsis were still unappraised entities. Nursing was not standardized. The country practitioner was dependent on his own resources. Distances were long in the time sense. Roads and conveyances forbade the moving of the very sick. Hospitals were progressing in the larger centers, but the problem confronting the doctor was to reach them with his patient.

Of this period, one recalls incidents, many of which have their amusing side. A Christmas day in the nineties, cold with a drifting blizzard; a hurry-up call to John Doe's ranch, some forty-odd miles over a high divide.

"John very sick. Come at once and bring the priest."

The latter was always willing, so at two o'clock on that stormy afternoon, a start was made in a light cutter behind two sure-footed ponies.

Seven o'clock found us over the divide, after numerous tip-overs and scrambles through drifts. A friendly rancher stabled our horses, and supplied us with a fresh team and some hot coffee.

Finally, at 11:30 p. m. we drove to John Doe's door. The old man was sitting by the stove smoking a black pipe.

"Come in, come in; but I don't need you. I was real bad off, but I'm all right now."

(Evidently the gallstone had passed the ampulla.) The priest was not angry. He was a good sport.

Again, two or three springs later, came an urgent summons to a bachelor's home in the foot-hills. He had been shooting woodchucks with a .22 caliber rifle, lost his balance, fallen over a cliff, and hopelessly smashed his right leg within a few inches of the knee.

The kitchen with its long table, a bright fire and a large wash-boiler, was the obvious place. Chloroform was given by the operator, with a turn-over to a clever neighbor. Another neighbor held the only lamp. The tibia was about half sawn through when—crash! Darkness! On the floor had gone lamp and neighbor!

Postscript—the patient recovered with a good stump.

Reference has been made to diphtheria, which recalls another incident.

On a March evening, a call was made to the high woods to see some children who were ill with the disease.

The road crossed three high benches, long and narrow with precipitous sides. One had to be accurate in finding the road up and down them.

Returning, a March snow storm had come up. The first bench was safely negotiated, and the second one climbed. It was quite dark, and the snow had that peculiar whirling character that made direction impossible. The problem was to find the top of the road down. A haystack on the right-hand was identified, and taken as a land mark. The team faced into what seemed to be the right direction, and were given their head. They plodded along for some twenty minutes when—up loomed a haystack.

"Why, darn it, that is the haystack we started from!"

Four attempts were made, but each time, up loomed the same old haystack. Seeing that the team was bent on traveling in circles and the narrow bench had high sides, effort to find the road was abandoned.

Beside the darned old haystack, cold and shivery, we waited till morning.

Up in a corner of Northern New York, a man named Trudeau was doing something new with tuberculosis. Curiously enough, during his first decade of practice, the writer saw little of the disease. Vital statistics had but small degree of organization and accuracy, so figures cannot be quoted; but the opinion prevailed that, outside of two groups, the Indian and the silicotic miner, there was little of it among the pioneer population.

While the causative factor had been found, tuberculin developed, and the value of rest, as a therapeutic measure, recognized and accepted, the importance of infection had hardly been touched upon. The old advice of "Go West, live out of doors and rough it" was still given, more or less promiscuously. We clung to the idea of heredity, and loved to blame our troubles on the "strumous diatheses." Syrup of the iodide of iron was a popular remedy. Reference has been made to the silicotic miner. Two great industries supported the state: mining and stock-raising. The mining was of the hard rock character, mostly in silica formations. The hand-drill in the prospects and the dust-producing buzzy in the more developed mines were used. As the industry grew, the tendency was to eliminate the prospector with his hand-drill, and substitute for him concentrations of mining where mechanism to an increasing degree supplemented labor. The compressed air-drill, efficient but dust-producing, took the center of the stage.

Early in the period under discussion, the practitioner had recognized a type. He was an old miner who had spent his life prospecting. He suffered from fatigue and shortness of breath. He had a chronic cough, slightly productive, and generally negative. He had a barrel-shaped chest with greatly diminished expansion. And the stethoscope revealed a few scattered râles.

Remedies for "chronic bronchitis" got us nowhere. This old miner used to fall a ready victim to the mining camp pneumonias that used to plague us in the winters.

With the beginning of the present century, mining became more and more concentrated in the county of Silver Bow. Silicosis, too, became to a constantly greater degree, a source of anxiety. The disease was getting into firm ground scientifically. The X-ray had come to help us, and we were able to define, with a fair degree of accuracy, the extent and character of its pathology.

More disquieting still was the tubercular death rate in Silver Bow. There seemed to be some unhappy link between silicosis and tuberculosis. That tuberculosis was an infectious disease; that prolonged and concentrated exposure to it was the dominating factor in its spread; that the silicotic miner was a potentially ripe victim for this prolonged and concentrated exposure, were facts that slowly but insistently dawned upon us all.

Public realization found expression in the 12th session of the Montana Legislature, when funds were allotted for the building of a sanatorium on a site donated by a great company. Of its future, more anon.

With the turn of the century, too, a great change was taking place in the state. Another industry was to be added to our two basic ones, and it was coming fast—dry land farming! Several causes contributed: a series of wet years, a nation-wide urge for free land, and intensive encouragement by the railroads to prospective new settlers. The ranges in a great measure melted away, to be split up into quarter sections and occupied. By 1910-1912, the movement had assumed the character of a boom. Our population increased by leaps and bounds. Counties were divided and county seats multiplied. With the increase in population came new problems and new

responsibilities, and among them, more or less overnight, we became tuberculosis-conscious. How was this consciousness to find expression?

Our State Board of Health was organized under legislative act in 1901. For the first few years its secretaries served only part-time. But from 1908, a full-time one was employed. In 1910, we joined the national registration area. In 1912, the present secretary was appointed, and has served continuously and with marked success since that time. In 1913, tuberculosis was declared by law a reportable communicable disease.

The people of the state have been singularly fortunate in having a non-political board with its membership selected by the state medical society. From these selections, the governor appoints. It has been sanely progressive, and at all times prompt to encourage new views. At the same time, it has not been backward in curbing over-enthusiasms. As its personnel rests with the organized profession, it has their confidence and support. Its attitude towards voluntary tuberculosis work has always been sympathetic and helpful.

Now another new factor was to enter the field. Montana had been, perhaps, a little backward in lining-up with the National Tuberculosis Association. And it was not until 1916 that this was accomplished. The state flower, the bitter-root blossom, was used on the seals and the first year's sale went over enthusiastically. A full-time nurse was also employed during this year, and the fullest measure of coöperation was obtained from the State Board of Health. From this beginning, the work has steadily marched forward in usefulness and scope.

To return to the sanatorium. Its modest beginning has been shown to be due to the prevalence of silicosis in the state. The first patient was admitted to it in the spring of 1913. Some two years later, six "open air" sleeping cottages were added. In 1918, a thirty-bed pavilion was built. In 1920, a forty-five bed hospital unit was completed to care for silicotics. In 1921, the Walsh cottage was finished and occupied. It was erected as a memorial to the late Mrs. T. J. Walsh, and was a joint gift from the senator and the women's clubs. A committee has supervised its furnishing and maintenance, up to the present time. In 1924, a thirty-bed children's pavilion was constructed. And finally, with the aid of the P.W.A., a most up-to-date sixty-five bed unit was finished and occupied in the early spring of 1936. It contains all surgical facilities as well as complete offices. The institution has evolved to a total of 215 beds.

Like the institution, too, treatment has evolved. Collapse therapy began only tentatively, owing to the large incidence of silicosis among the patients. Artificial pneumothorax work was initiated in 1922, and has since grown steadily. Operations on the phrenic followed, and in turn all the modern surgical procedures, including thoracoplasties. Silicosis is on the wane, due to the introduction of the water-liner in the drills, and the great improvement in ventilation methods in the mines. To a much greater degree than formerly, the energies of the institution are being used for tuberculosis proper.

To sum up—with a profession thoroughly on its toes, its Board of Health, its voluntary anti-tuberculosis organization and its modern sanatorium, the state is thoroughly abreast of the times and equipped to handle in its entirety the problem of human tuberculosis.

What can be said in retrospect? Perhaps the salient fact that stands out is that in the era we have sketched, human tuberculosis has vacated its unenviable position at the head of the death list, and moved to sixth place. All the myths and fog surrounding it have been blown away. The principles of its treatment have been firmly established, and, best of all, its infectious character has

been generally recognized and methods of attack directed as a result of such recognition.

Tuberculin has found its place, and the Mantoux test has been generally accepted. Continued progress in the future lies in the public support of large-scale group investigations, so that infection may be promptly tracked to its lair. This will enable early discovery to be made of incipient cases, so that they may secure prompt treatment for themselves, as well as removal from contact with the infective agency.

The writer feels that Montana is doing her bit towards this end.

A Tuberculosis Case-Finding Program^{*} For the Smaller College

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IT SEEMS APPROPRIATE that this round table on communicable disease control should begin with a discussion of tuberculosis among college students, since tuberculosis is one of the most communicable of all diseases. Because the period between the original infection and the development of symptoms is so prolonged, however, and because the onset is generally so insidious, the public fails to regard the constant threat of tuberculosis in the same light that it considers epidemics of other types striking with more dramatic suddenness, or disabling or killing their victims more rapidly.

Tuberculosis is a disease that rears its head in the relatively young, most of the deaths from this cause occurring between the middle 'teen ages and the middle forties. We now know, however, that the primary phase of the disease usually occurs some years previous to the development of the secondary, or so-called adult, destructive form of tuberculosis. That adults may develop their first infection pulmonary tuberculosis after having escaped during the childhood and adolescent periods is well-known, and will undoubtedly become increasingly frequent, but the time of life that still provides the greatest opportunity for contact between the uninfected and those who are spreading tubercle bacilli is childhood.

Much progress has been made in combating and controlling tuberculosis, but much more remains to be done if the disease is to be as successfully eradicated from human society as it has been from our dairy herds. Since the turn of the century, deaths from tuberculosis have declined to about one-fourth of their previous level, and tuberculosis has slipped from first to seventh place as a cause of death for the whole population. Yet the disease still shows its greatest mortality in men and women of college age, and during the 25-year span between the ages of ten and 35 it leads the parade of fatal diseases.

^{*} Delivered at the annual meeting of the North Central Section of the American Student Health Association at Iowa City, May, 1937.

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Young women exceed men in showing the greatest incidence of the disease, and the highest mortality from it during the years between 18 and 24, the period of late adolescence and early adult life, although more men are affected during the whole life span. A survey in Massachusetts revealed that of every three deaths occurring in females between 15 and 30, one was due to tuberculosis. A recent five-year study in the State of Iowa showed 44 out of every 100 deaths among those of high school age were to be charged against tuberculosis.

When we wait for the tuberculous to consult us because of such well developed symptoms as cough, chest pain, loss of weight, blood-spitting, or the like, or if we wait to make a diagnosis until we can hear râles in the lungs, we have lost an average of two to two and one-half precious years in finding and treating the disease—the most hopeful time in point of ultimate cure. That this policy is still widely followed, however, is unfortunately true, as shown by the fact that our sanatoria are yet largely occupied by patients who entered in a moderately or far-advanced stage of tuberculosis. Not only does this result in a longer hospital stay per patient, but it automatically denies other cases earlier admission for sanatorium care. Sadder yet, it greatly decreases for each individual diagnosed and treated late in his disease the hope of ultimate health and usefulness. Trudeau Sanatorium figures disclose that while only 10 per cent of those admitted in a minimal stage die within the following fifteen years, 72 per cent of the far-advanced and 27 per cent of the moderately-advanced are dead at the end of that time. Contrast this outlook with the encouraging experience at such schools as the University of Michigan, where during five years, 100 cases of tuberculosis were found among students—62 per cent in a minimal stage, 30 per cent moderately-advanced, and only 8 per cent far-advanced.

Salvation lies, therefore, in early diagnosis, which is neither costly nor difficult. All it requires is a careful,

frequently repeated screening process, by means of which the early cases are recognized, the infected placed under appropriate care and scrutiny, the cases capable of spreading the disease removed from among the well, and all contacts at school or at home relentlessly searched out and watched for the first recognizable evidence of tuberculosis.

Colleges and universities contain the most fertile soil for the growing of tuberculosis, namely: the bodies of adolescents and young adults, but as a result they also provide one of the best mediums for the carrying on of a tuberculosis case-finding program and hence the thinning-out of the disease. Those schools with well developed, sometimes elaborate student health services can come nearest to following an ideal plan, but no school, no matter how small, need neglect its significant opportunity. A college that is not making a determined search for tuberculosis among its students today can hardly regard itself as a modernly and socially-minded institution.

First there must be education of all those concerned as to the need for a plan and the benefits to be derived from its operation. The administration must accept the educational implications and set up the necessary organization and financial structure. The parents of students must be willing that protective measures, which benefit all and harm none, be employed on their children. The students must understand what is to be attempted and must be eager for its success. A certain amount of administrative pressure is inevitably necessary in dealing with young people, their problems, and their welfare, but the pressure must be moral and not coercive. Seldom will a student, properly informed of the value of tuberculin testing, fail to do his part in the program.

A carefully conducted and complete physical examination of all new students *when they enter college* is necessary. At this time a history is obtained by the examiner that will reveal any previous contacts between the student and known cases of tuberculosis. Inquiry is also made concerning illnesses in the student, his family or his friends, suggestive of tuberculosis. Every college in step with modern trends should have at least part-time medical personnel supervising its student health endeavors, but where this has not yet been arranged, or to supplement the existing staff, other physicians from the community should be and practically always are available to assist with entrance and periodic physical examinations. Their interest in the school is usually high, and their services for a project of such public importance can be secured at a rate that will fit any reasonable budget. Naturally, they should receive fees commensurate with the amount and value of the services they render. High class medical supervision demands proper remuneration.

As a part of the entrance physical examination, or early in the fall term, each student should receive the Mantoux intradermal tuberculin test. If Old Tuberculin is used, a good brand from a reliable manufacturer is urged, such as that from the Saranac Laboratory, Saranac Lake, New York. For the sake of uniformity,

however, most schools are now using the Purified Protein Derivative (of Seibert), known as P.P.D. and available in packages suitable for small or large scale testing. In either case, the preliminary dose is small, consisting of 0.01 or sometimes 0.1 mgm. of O.T. or 0.00002 mgm. P.P.D., given intradermally, using a Schick test type of needle, and a tuberculin syringe graduated in hundredths of a cubic centimeter. All those who, at the end of 48 hours, do not react to the first dose receive in the case of O.T. a second dose of 1.0 mgm., or in the case of P.P.D., a dose of 0.005 mgm. Positive reactors to the two doses will in this section of the country number about 25 per cent on the average, and should receive an immediate chest X-ray. They need not, of course, be retested in subsequent years, but the negative reactors of this year should be re-tuberculin tested annually. A one-dose method is being sought that will simplify the procedure, but has not yet been developed to a point safe for the more sensitive of the positive reactors.

Large schools often possess their own X-ray facilities, and effect considerable savings thereby. Smaller schools can afford neither the initial outlay for high-priced apparatus, with all its accessory equipment, nor the overhead involved in operating it on a part-time basis. There is practically always a reliable machine in the community, however, as in a physician's office, a clinic or hospital, or at a public or private tuberculosis sanatorium. Portable machines of reasonable accuracy are now also to be had. Special rates for films can usually be arranged when a large group is to receive roentgenograms. The interpretation of the films as a rule costs more than the developed films, and rightfully there should be a reasonable fee for this service, without which the pictures would be meaningless. It is quite possible, however, that a physician specially trained in tuberculosis work will be close at hand and willing to read a college health service's chest X-rays at a flat fee, thus cutting down on the individual cost.

The practice of wholesale X-raying of all students does not seem supportable in any part of the country, but much less here in the midwest where reactors are relatively few, even though many interesting conditions other than pulmonary tuberculosis are admittedly occasionally discovered. But a single celluloid film of every positive tuberculin reactor does seem the minimum, with serial films or stereoscopic studies whenever demanded by the contents of the original picture. Unfortunately, paper films, cheap in cost, do not seem very satisfactory. The fluoroscope is gaining favor in trained hands and before trained eyes, not as a substitute for good chest films, but as a supplement to the information it is possible to derive from the latter. Some small schools may be able to arrange for this additional service, although with other than the fastest, most modern screens, and if employed by other than experts, fluoroscopic findings will not only be disappointing, they will be actually dangerous if relied upon in the search for early tuberculosis.

What more should the college do with and for its positive reactors? Cases that show no evidence of tuberculosis by X-ray, or a healed childhood type, or an

arrested form of the disease, will require careful physical examination of the lungs annually or oftener, especially if colds or influenza or pneumonia be encountered. A follow-up X-ray should be arranged for at least once each year, and preferably oftener than this in the supposedly arrested group. This latter group should be additionally protected from undue strain by being required to carry a somewhat reduced schedule of work, academic and otherwise, and by automatic disbarment from the required physical education program.

Cases showing pulmonary tuberculosis in what may suggest an active form should be placed in the college hospital at once, and treated as cases of communicable disease until proved otherwise. Careful temperature, pulse and respiration charts must be kept, sputum repeatedly examined for the presence of tubercle bacilli, and daily chest examinations made, râles being listened for both before and after the expiratory cough. Other laboratory examinations are important and can usually be arranged through coöperation with nearby hospitals or clinics, if the college does not possess its own technical facilities. They include leucocyte counts, total and differential; estimation of the red blood cells, their hemoglobin, and their rate of sedimentation as outlined by Cutler; examination of fasting stomach contents for the presence of acid-fast organisms if sputum is negative or cannot be obtained for study. Guinea pig inoculation is reported to reinforce this method almost 50 per cent.

Cases that are progressive, communicable, or both, as determined above, should withdraw from school at once to obtain prompt treatment, and to protect the rest of the campus against infection. These will usually number less than one per cent of those tested. Minimal cases, if allowed to remain in school, must carry reduced loads of work; be excused from physical education requirement; observe regular hours, including rest periods daily; secure an adequate diet; and remain under the close scrutiny of the school physician and the radiologist. At the first sign of a progression of the lesion, withdrawal from school must be insisted upon.

Parents of all positive reactors should be contacted personally or by correspondence in every case where findings are such as to make this notification necessary and desirable. Family physicians should receive as detailed reports in every instance as are available. Their interest in the problem and their coöperation toward its solution are necessarily to be sought by the school physician, who must, therefore, himself coöperate to the limit with the doctor who ordinarily has charge of the patient. The aid of the family physician should be enlisted, too, in tracing the possible source of infection through which the student developed his sensitization to tuberculo-protein. Potter has recently summed this up as follows:

" without the family physician this work cannot be fully successful. It is to him that the parents or guardians often turn for advice as to the necessity and safety of such studies and the practicality of the cost involved. Furthermore, to assure best results, school authorities must solicit the

aid of the family physician if possible contacts are to be looked for at home. Unless the general practitioner is convinced of the importance of such studies no public health scheme, as the one just cited, can be of lasting or even of immediate benefit."

The foregoing plan would appear ridiculous in its hope to find and control tuberculosis among students if it stopped with the members of the student body. A college owes it to its students to insist on a healthful faculty, with safe food-handlers and other employees concerned with student life, just as definitely as to maintain modern plumbing, clean buildings, adequate heat, light, and fresh air. Therefore, no tuberculosis plan can succeed 100 per cent that neglects the testing, X-raying and examining of the college staff along with the students. For some reason college executives will usually agree to a plan for students and perhaps for food handlers, but will balk at one applied universally to faculty and employees. We must educate our college presidents, just as we must impress our greenest freshmen. Conversely, our presidents depend upon us to render their task with the faculty easier by popularizing in professorial minds the idea of a sound preventive program.

A word as to cost may not be amiss. Saranac Lake Old Tuberculin costs about 50 cents per cubic centimeter when obtained in 10 cc. quantities, slightly more in smaller amounts. One cc., containing 1 gram of O.T., will allow a dilution sufficient for several thousand first stage skin tests of 0.1 mgm. strength, or several hundred second stage skin tests of 1.0 mgm. strength. Old Tuberculin, with a small amount of phenol as a preservative, and stored in the refrigerator, will keep for several days or even a few weeks, though it is better to make up fresh dilutions frequently, as the weaker solutions do deteriorate rather rapidly. Old Tuberculin lends itself admirably to those situations where only a few patients are being tested daily, and where P.P.D. would be prohibitive on the basis of cost and bother.

Purified Protein Derivative will cost approximately five cents per test, if we allow for some slight waste during the process. It must be used at once after mixing. It is far more sensitive than O.T., less liable to give non-specific reactions, and probably best for large-scale testing. Since its use has become so wide-spread, it is hoped that for the sake of uniform results and the pooling of mutual experience, more and more schools will adopt it as their standard testing material.

Tuberculin syringes cost \$2.00 to \$2.50 each, and at least four are necessary for speedy testing methods.

Platinum-iridium needles, at 80 cents, are best for rapid testing, as they may be flamed between tests. They are frail, however, and seldom survive 100 tests apiece. Ordinary stainless steel needles must be individually sterilized, and call for a change of needles between tests. This greatly delays the procedure and requires a large number of needles in use.

Best grade blue-base celluloid films, 14x17 inches, can be bought at from 60 to 75 cents apiece in quantities of

six dozen or more. When developed in moderate-size batches, the cost of the necessary chemicals will average about seven to 10 cents per film. An error factor of from 3 to 6 per cent, depending on local conditions, should be allowed for unsatisfactory films that must be repeated. A fair "over-head charge" per film must also be included to cover use of the machine, services of the operator, and so forth.

Testing a college group of 500 might be financed as follows:

500 first doses of P.P.D. (make up enough for 600).....	\$24.00
375 second doses of P.P.D. (make up enough for 500).....	20.00
10 platinum-iridium needles @ \$0.80.....	8.00
4 tuberculin syringes @ \$2.25.....	9.00
2 alcohol lamps @ \$0.50.....	1.00
Alcohol.....	1.00
Cotton and incidentals.....	1.00
Records, cards, etc.....	5.00
	\$69.00

To this must be added the cost of 125 immediate chest films, with approximately 25 additional for spoilage and follow-up during the year. Also the cost of supplying for three afternoons or evenings the services of two physicians, one nurse or other trained helper, and three untrained helpers to act as clerks and marshals must be included, along with the fee to the specialist interpreting the X-ray films.

These last unstated amounts will vary in different localities, but I believe that with careful planning the whole program can be held within a \$500-\$1,000 total, which uses up only \$1 to \$2 of the health fee paid by each student—surely a small amount for the protection afforded.

Finally, uniform, detailed records and statistics should be kept, so that the efforts of the tuberculosis committee of the American Student Health Association may be made more fruitful by the coöperation of all member institutions. Both this committee, with its close relationship to the National Tuberculosis Association, and the local health authorities interested in tuberculosis work will be found ready and anxious to assist with advice or

other aid toward the solution of college health problems and the success of all tuberculosis case-finding programs.

The smaller college, with its intimate relationship between students and staff, has many advantages over the large institutions in carrying on such programs. Its main problem would seem to be in achieving a workable organization. Once arranged and operating, a good organization will improve each subsequent year, with enlarging benefits to the public health increasingly in evidence.

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The History and Progress of Tuberculosis Eradication Among Cattle

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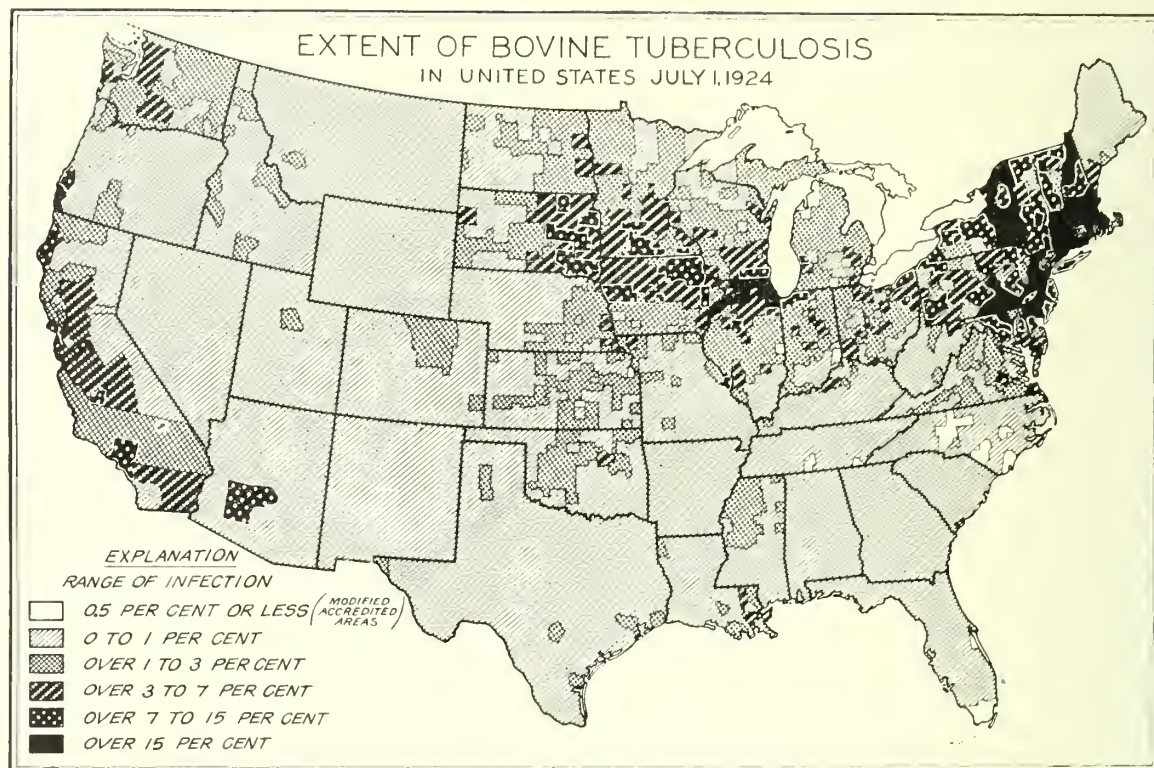
Washington, D. C.

SOON after the discovery of tuberculin by Professor Robert Koch in Germany in 1890, some of this material was brought to the United States by the late Dr. Leonard Pearson, chief of the veterinary department of the University of Pennsylvania, who applied a tuberculin test to about 80 head of cattle near Philadelphia, Pa., on March 3, 1892, 30 animals of which gave positive reactions to the test. This was the first tuberculin test applied to cattle in the United States. The results of this test, and the positive autopsy findings,

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led to the tuberculin testing of many other herds of cattle in various parts of the country.

These tests revealed the fact that tuberculosis among cattle was quite well-established in many localities, and the use of the tuberculin test was very helpful in locating the centers of infection. After these conditions were found to exist, many attempts were made to control the disease by various state livestock sanitary officials in different parts of the country. Some of these gave fairly satisfactory results, and the work which was done prior to 1917 was very helpful in planning methods for use



in connection with the extensive coöperative campaign to eradicate the disease, which was started that year.

In 1906, the bureau of animal industry undertook to conduct considerable work in the tuberculin testing of herds of cattle located in the states of Virginia and Maryland, and the District of Columbia, and in 1909 it was decided to conduct a test of all the cattle in the District. The results of this first work on what might be termed an "area plan" were very interesting.

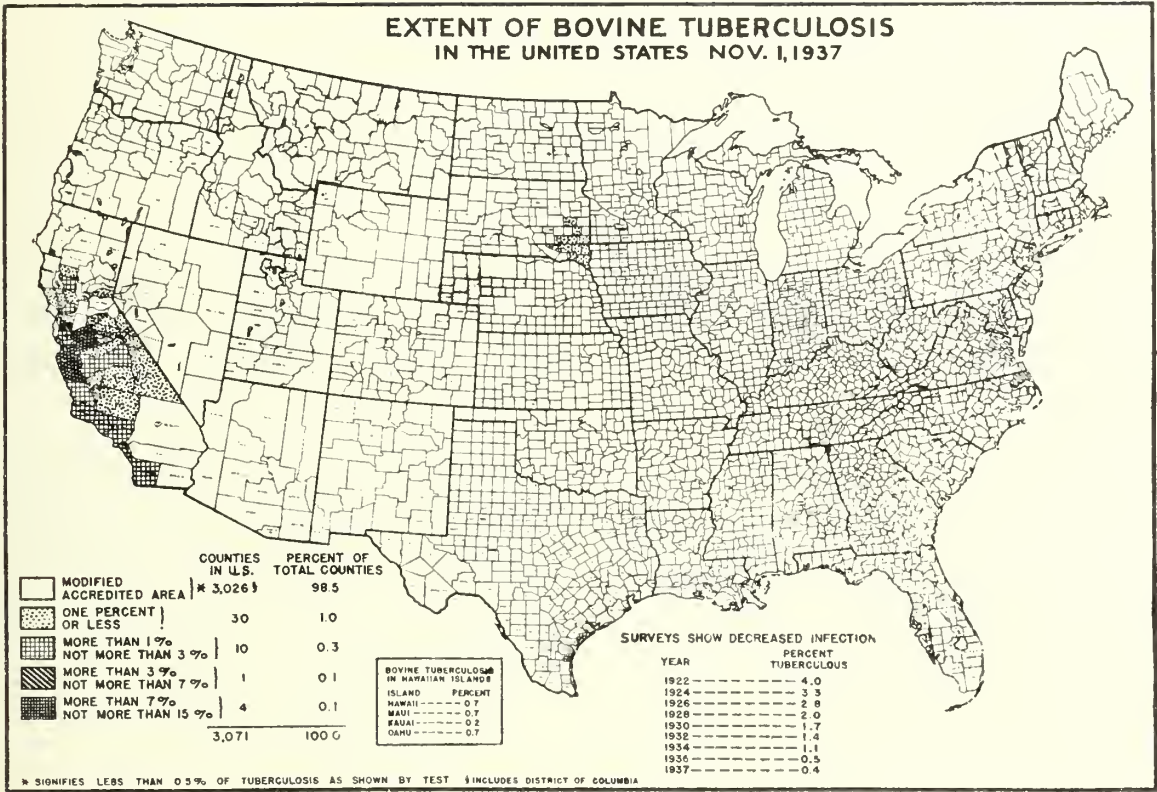
When the initial testing of about 1,700 cattle located in the District of Columbia was completed, it was found that about 19 per cent gave a positive reaction to the test. The reactors were removed, and the infection was rapidly reduced by following appropriate methods of cleaning and disinfecting the premises occupied by these cattle. No reactors have been reported among the cattle in the District of Columbia for many years.

In the spring of 1917, the bureau of animal industry was in a position to establish the tuberculosis eradication division, as Congress had appropriated \$75,000 for operating expenses. Such action was taken, and much preliminary work was conducted throughout the United States in preparing for a uniform accredited herd plan. In December, 1917, during the meeting of the United States Livestock Sanitary Association at Chicago, Ill., a special committee, composed of several cattle breeders and federal and state veterinarians, prepared rules and regulations for a "tuberculosis-free accredited herd plan." This plan was found to be quite satisfactory, and was promptly adopted by that association and approved by

the bureau of animal industry. During the next few months it was also adopted by the livestock sanitary authorities of several states. Later, it was adopted by all of them. Each year, during the meeting of the United States Livestock Sanitary Association, the plan was reviewed, and changes were made that were considered to be of importance.

The accredited herd plan was found to be very popular among breeders of purebred cattle as well as many owners of herds of grade cattle. After the plan, which began in a small way, had been in operation for about five years, there were 625,000 cattle, located in about 30,000 fully accredited herds. This feature of the work has been continued since that time, and at the close of December, 1937, a total of 270,572 herds, containing 3,804,327 cattle, were in that classification.

The number of fully accredited herds would be considerably greater were it not for the fact that as the work developed, a system was adopted whereby all the cattle in a given area, such as a county, were tuberculin-tested and the reactors were removed. This "area" plan proved to be practicable in all parts of the country, but was not taken up to any great extent until the intradermic tuberculin test was perfected. The veterinarians of the bureau, as well as those employed by the states, devoted considerable time in the field and at the public stockyards in perfecting this method of testing, and in March, 1920, the intradermic method was officially recognized by the bureau and by all but a few states throughout the country.



Area Plan

The tuberculin testing of cattle on a group or "area" basis was taken up in several states, and arrangements made to give recognition to the accomplishments in this connection. When the degree of infection of bovine tuberculosis among cattle in a county had been reduced to less than one-half of one per cent, the county was declared to be a "modified tuberculosis-free accredited area" under the provisions of a uniform plan adopted by the United States Livestock Sanitary Association. In July, 1923, 17 counties, located in four states, were placed in that status. These were the first counties in the United States to be given that recognition. The work spread to many other parts of the country, and about five years later there were 499 counties in the modified accredited area.

Much more progress was made during the years following 1928; and in 1934, when the federal government provided additional funds for the work, there were about 1,800 counties of the total of 3,071 in the United States in that classification. Since 1934, with additional Federal funds each year, it has been possible greatly to increase the volume of tuberculin testing. During the next two years the total number of counties in the modified accredited area had increased to about 2,900. On January 1, 1938, 3,039 counties were listed as modified accredited areas. All the counties in all the states with the exception of 22 in California and 10 in South Dakota are in that classification. In these two states the work is being conducted in the counties not in the modi-

fied accredited area. It is believed that it will be possible to "modify" all these remaining counties within the next 12 or 18 months. Tuberculosis eradication work on an area basis has also been conducted in Puerto Rico during the last two years, where a very slight degree of infection has been found.

Surveys Showing Approximate Extent of Bovine Tuberculosis

In order to determine the approximate extent of bovine tuberculosis in the different parts of the United States, the state and federal representatives in charge of tuberculosis eradication work submitted information in 1922 for the preparation of a map to show the incidence of the disease in each county in the country. The information obtained disclosed the fact that tuberculosis among cattle did not exceed one per cent in about one-half of the total area of the United States, and that about 41 per cent of all the cattle in the United States were in this lightly infected area. In the remaining half of the counties, the disease existed to more than one per cent but not exceeding 10 per cent, with the exception of a comparatively small area. It was in these more highly infected sections that the problem of eradicating the disease was much more difficult.

The extent of the disease was gradually reduced as the eradication work progressed, and it is now estimated that the degree of infection does not exceed 0.4 per cent throughout the United States. In a great many parts of the country, the degree of infection is considerably less than that.

Reports received from the meat inspection division of the bureau of animal industry indicate a decrease in the amount of tuberculosis found in cattle and swine slaughtered under federal inspection. During the fiscal year ended June 30, 1937, approximately 10,800,000 cattle were slaughtered under federal supervision, of which number 15,800, or 0.15 per cent, showed some evidence of tuberculosis. These figures do not include cattle that had reacted to the tuberculin test. Of the 15,800 cattle mentioned, only about 4,000 showed more than a slight degree of infection. In 1918, at the beginning of the tuberculosis eradication campaign, approximately the same number of cattle were slaughtered under federal supervision. Of that number, about 197,000, or 1.8 per cent, showed some evidence of the disease, and 46,000 were advanced cases of tuberculosis.

The meat inspection records also serve a very valuable purpose in furnishing information as to the location of tuberculosis among cattle and hogs. Many times it is possible for the inspectors to trace the origin of the infected animals and take necessary steps to eradicate the disease from the premises. The reduction in the percentage of tuberculous hogs found on postmortem examination has not been so rapid as in the case of cattle for the reason that hogs are infected also with the avian type of the disease.

Public Health Ordinances

When tuberculosis eradication work was first undertaken, there was some belief on the part of interested persons that any publicity featuring the relation of bovine tuberculosis to the public health question would be inadvisable, and might reduce the consumption of dairy products. As the work advanced, however, many reports were received from the field indicating that municipal public health officials were enacting ordinances requiring the tuberculin testing of dairy herds used in furnishing milk to their respective localities, and it was found that the people were interested in learning the relationship of tuberculosis in cattle to public health. Publicity was, therefore, necessary; and as soon as the public learned that the disease was being placed under control there was a feeling of security which, naturally, led to an increase in the consumption of dairy products.

The degree of infection of tuberculosis in dairy cattle was found to be very extensive around some of the large municipalities, and when cities such as Chicago, Ill., enacted ordinances requiring that all dairy cattle be tuberculin-tested, it became necessary to condemn a large number of them. This occurred in the Chicago area in 1926. In a number of cities throughout the country ordinances were enacted requiring that butter and cheese be made only from cream or milk originating in herds in which all the cattle were under supervision for the eradication of tuberculosis.

This action has not only been most helpful in bringing about more interest in the retesting of cattle in the

modified accredited areas, but has created interest in other sections of the country where dairy products are used chiefly in the manufacture of butter and cheese. The incidence of tuberculosis in humans has, no doubt, been reduced through the work of eradicating bovine tuberculosis.

We are all deeply indebted to the great service rendered by members of the medical profession in this campaign, and, while only a few names will be mentioned in this connection, it is a pleasure to call attention to the many and valuable contributions made by Drs. Charles H. Mayo and D. C. Lockhead, of Rochester, Minn., and J. Arthur Myers, of Minneapolis, Minn.

Appraisal, Salvage, and Indemnity

For many years it has been the custom in this country for owners to be partially compensated for animals officially condemned on account of tuberculosis. Many of the states had this provision prior to the time the federal government took part in the payment of indemnities for tuberculous cattle. In different states, various amounts are received by owners for condemned cattle, but the maximum federal payment is \$25 for grade cattle and \$50 for registered purebred cattle. The owner receives the salvage derived from the sale of the animal, and in nearly all states a state payment is also made.

Continuation of Tuberculin Testing Necessary

From what has been stated in this article, it will be noted that splendid progress has been made in reducing the amount of tuberculosis among cattle in recent years, but, owing to the nature of the disease, it will be necessary to continue the tuberculin testing of certain groups of cattle for many years to come. The volume of this testing will, of course, be greater in sections of the country where tuberculosis existed to a considerable extent when the work was undertaken, but the expenditures for the program will be greatly reduced as time goes on due to the lesser number of cattle reacting to the test. As has been done in the past, the states will be required to make provisions for handling this problem.

Success in this campaign would not have been possible without the splendid coöperation that has been received from the efficient state organizations familiar with local conditions. The cattle owners throughout the nation have strongly supported the work of tuberculosis eradication, and deserve much credit for it. County and township authorities in many localities have been very helpful in this campaign. Many organizations such as health boards and civic clubs have contributed much to the success of this undertaking. Livestock exchanges, meat packers, and livestock commissioners have coöperated in an excellent manner. Mention must also be made of the splendid publicity given the campaign by the press, both urban and agricultural, the radio, and many other means.

Induced Pneumoperitoneum in the Treatment of Pulmonary Tuberculosis*

A Review of Two Hundred Cases at Olive View Sanatorium

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History

THE INJECTION OF AIR into the peritoneal cavity for diagnostic and therapeutic purposes was first reported more than a third of a century ago. Pneumoperitoneum in the treatment of intestinal tuberculosis and tuberculous peritonitis is recorded in numerous publications. Its use was not primarily directed against pulmonary tuberculosis, however, until recent years. Then, independently, Vajda in Europe, Banyai in America, and later Verwath and Rehberg in Europe, and Joannides and Trimble in America, suggested pneumoperitoneum as a treatment for pulmonary tuberculosis. The inspiration for such application has been variously described as the observation of improvement in pulmonary lesions in patients in whom the procedure was used for intestinal disease; good results in patients in whom it was established accidentally in the course of artificial pneumothorax; the observation of temporary beneficial effects of pregnancy in tuberculous women; and the recognition from experience with the Rubin test that air is borne in the abdominal cavity with even less disturbance than in the thorax.

Indications

Induced pneumoperitoneum has been recommended especially to control hemorrhage and to obtain cavity closure where pneumothorax is impossible or ineffectual because of adhesions, and where additional phrenic paralysis has been inadequate or contraindicated because of low vital capacity. Another indication is in cases of bilateral involvement in which low vital capacity contraindicates bilateral pneumothorax or phrenic paralysis. Still another is to prepare patients for thoracic surgery who are at the time in too poor condition for radical procedures.

Pneumoperitoneum in general is used in an attempt to close cavities, render sputum negative or relieve symptoms where bed-rest and other forms of compression therapy have not secured the desired results. It should be remembered and emphasized that pneumoperitoneum is only an accessory, mechanical measure in the treatment of pulmonary tuberculosis, and should not preclude the application of any other compression measures which may be indicated.

Thus in the Olive View series, only 9 of the 200 patients have never received some other form of collapse therapy. In 179 patients, pneumothorax had been repeat-

edly attempted, usually with finding of no free space or only small, ineffectual pockets. One hundred and sixty of these, as well as 12 others in which pneumothorax had not been attempted, were given the benefit of phrenic paralysis, usually temporary by phrenic nerve crush. Three had had thoracoplasty before admission to the sanatorium.

Olive View Series

Antedating this group which we are here reporting, more than 20 patients at Olive View Sanatorium had had pneumoperitoneum established, mainly for the treatment of intestinal and peritoneal tuberculosis. The results in that series, most of whom died in the institution within a year, were by no means such as to arouse great enthusiasm. Since that time, however, more than 200 patients have received this treatment for the purpose of aiding their pulmonary lesions. In view of the scepticism, antagonism and even scorn, with which this method of treatment has been greeted in some places, an analysis of this large group treated here may be of value.

Of the 200 patients at Olive View Sanatorium given induced pneumoperitoneum during the past two years, 98 were males and 102 were females. The ages varied, as do those of our patients in general, there being 38 under twenty years of age; 141 between twenty and forty; 17 over forty; and 4 patients over fifty years of age. The extremes of age were nine to fifty-nine. The stage of the disease was far-advanced in 175 patients, moderately advanced in 24, and minimal in only one instance. Intestinal tuberculosis had been recognized clinically in less than 10 per cent of these patients.

The average period of care and study for these patients in the sanatorium before the institution of artificial pneumoperitoneum was 11 months. The longest period was 40 months, and the shortest only two days. The average duration of treatment with pneumoperitoneum was 7 months; the longest being more than 2 years; and the shortest representing but a single injection. More than half of these patients are still receiving refills. The refills averaged 800 cc. of air, and varied from as low as 200 cc. to as high as 1,400 cc. The usual interval between refills has been 7 days, though the shortest was 4 and the longest was 14 days. In several instances where for various reasons pneumoperitoneum had been abandoned and allowed to absorb, it was later re-established without difficulty. In a few instances, pneumoperitoneum has been established in cases in which several years previously abdominal operations had been performed, following which there had been drainage for a period of months.

* (This study was made possible by the generous aid of the resident staff of Olive View Sanatorium, and the Works Progress Administration, Official Project Number 165-3-6250, to whom thanks are hereby rendered.)

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Complications and Autopsy Findings

Complications sufficient to cause marked discomfort were comparatively few. In 3 instances, pneumoperitoneum was discontinued because of the appearance of hernia. Four patients complained of extreme, immediate but transitory, epigastric and shoulder pain. Two had extensive sub-cutaneous emphysema. In 7 patients, marked distention of the abdomen developed on the day following refills, which might be ascribed to meteorism, or peritoneal effusion. Two presented abdominal adhesions of marked proportion visible on the X-ray, and in 3, fluid developed to a degree which required aspiration. In one patient, the procedure had to be discontinued because of obliterative peritonitis.

Free fluid, usually clear but occasionally turbid, was found in the abdomen in over half of the autopsied cases, varying from 150 cc. to 1,500 cc. in volume. In addition, a plastic exudate was found covering the viscera and matting the coils of the intestines together in two instances. More organized reactions appeared in the form of fibrotic plaques or thickening in other cases, usually discrete and scattered, but occasionally confluent and extensive, covering all of the exposed viscera.

Whereas the autopsy findings often showed evidence of considerable peritonitis, it is interesting to note that 5 patients during the course of artificial pneumoperitoneum had laparotomies performed because of intercurrent pathology, and in none of these was there evidence of fluid or peritonitis observed at operation, and postoperatively all of these patients had pneumoperitoneum re-established.

Clinical Observations

Among the interesting clinical observations made on these cases we may mention the following. The improvement in appetite, weight gain, and a subjective feeling reported as a sort of tonic effect of being inflated was quite contrary to what might have been predicted from the altered physiology incidental to the extreme viscerop-tosis of the liver, spleen and stomach. The X-ray films, taken with the patients erect, often showed the liver to be separated by as much as 20 centimeters from the diaphragm and displaced mesially, and the viscera massed apparently in the pelvis. A difference in the height of the diaphragm, averaging 2 centimeters, was observed fluoroscopically before and after refills in patients in whom pneumoperitoneum had been well-established. Posture had an effect upon the height of the diaphragm, as most patients showed a rise averaging 2 centimeters when standing. The selective action of induced pneumoperitoneum with unilateral phrenic crush is well-illustrated in cases with bilateral involvement where phrenic paralysis has been used on the more involved side, as the diaphragm on this side can often be elevated to the second or third rib with the injection of air, whereas the rise of the other diaphragm will be comparatively slight.

In general, there was a drop in vital capacity immediately following the institution of pneumoperito-

neum; but it was generally less marked than that following artificial pneumothorax, and in only a few instances was it followed by clinical evidence of dyspnea. A decrease was noted in 55 per cent of these patients, for an average of 12 per cent of their standard expected vital capacity. The vital capacity was unchanged in 20 per cent, and was increased in 25 per cent of those examined at various times following the establishment of pneumoperitoneum.

The erythrocyte sedimentation became slower in 60 per cent of our patients, was unchanged in 15 per cent and accelerated in 25 per cent.

Results

Thirty-two of these patients, or 16 per cent, have died since the institution of pneumoperitoneum, after an average of about 8 months' treatment. Autopsies were performed on 15, or more than 50 per cent of the 27 who died in the sanatorium. In view of the advanced stage of the disease in most of these patients, eighty-seven and a half per cent being far-advanced, and the failure of other measures in these cases, which failure formed the indication for the use of pneumoperitoneum, this case fatality rate cannot be held against pneumoperitoneum, especially since the autopsy findings did not indicate that this was a factor responsible for death in any case but one, where it merely accelerated what was otherwise an apparently certain demise.

The effects of this treatment must be considered mainly from a review of the individual cases, comparing the actual outcome with what might have been expected if the treatment had not been given. Clinically and symptomatically, improvement was noted in more than half of the patients treated.

One hundred and twenty of the 200 cases were selected at random and a careful analysis was made of their cavities. Of these cases, 90 per cent showed cavitation with a total of 211 cavities, and only 10 per cent gave X-ray evidence of infiltration without cavitation. Cavities in the right lung alone numbered 63; and in the left lung alone, 56. Bilateral cavities totalled 92. In the upper third were found 165 of these 211 cavities. In the middle third were found 30 cavities, and in the lower third, 16. Thus 78 per cent of the cavities were in the upper third.

Of the 211 cavities, 22 per cent of those in the upper third and 33 per cent of those in the middle third, and 31 per cent of those in the lower third could not be visualized by X-ray after pneumoperitoneum had been well-established. Reduction in the size of cavities was noted in an additional 12 per cent of those in the middle third. The remainder of the cavities showed no change, became larger, or more recent films were not available because of the short duration of the treatment or the departure of the patients.

In 11 patients showing infiltrative lesions without cavitation, 4 showed marked clearing of infiltration under pneumoperitoneum.

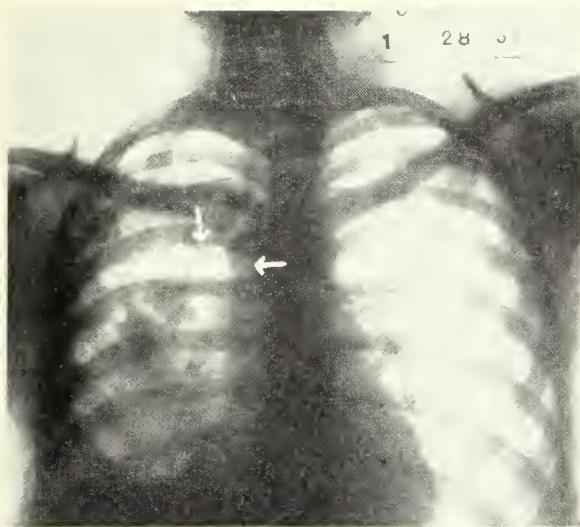


Figure 1—Case 3

Very large thin-walled cavity, with fluid level, in the right first interspace, which was not closed by an ineffectual, limited pneumothorax. Moderately dense infiltration and thickened pleura on the right.

In this series of 200 patients, 15 after a period of artificial pneumoperitoneum underwent thoracoplasty or extra-pleural pneumothorax who previous to the addition of pneumoperitoneum were in too poor condition, or had too much contralateral disease, to have withstood these more radical operations.

In our series, pneumoperitoneum did not prove particularly effective when used in an emergency to control hemorrhage.

Perhaps the most direct criterion of the effect of this treatment, however, is to be found in the effect on the sputum. Actual sputum conversion, that is, a change from previously positive to a negative sputum following the establishment of pneumoperitoneum, occurred in 57 patients out of the 173 patients whose sputum had been positive prior to the institution of this form of treatment. Most of these later negatives were based on examination of concentrated 24-hour specimens, and many of them on culture or animal inoculation. This represents a conversion of about 30 per cent, which we feel is better than might have been expected without the use of pneumoperitoneum as an additional treatment for these patients.

Illustrative Successful Case Reports

Case No. 1—C. W.—No. 9270—Female, age 33. Admitted to Olive View 1-12-37. Admission diagnosis tuberculosis, pulmonary, chronic, active, far-advanced, predominantly unilateral with cavity 3 by 5 centimeters in the left midlung which had shown no change for years despite pneumothorax. Sputum on admission was positive to smear, but became negative after 5 months of pneumoperitoneum, and has remained negative. Vital capacity before pneumoperitoneum was 45 per cent and afterward 50 per cent. Sedimentation time (Linzenmeier method) before pneumoperitoneum was 82, and afterward, 122 minutes. Pneumoperitoneum was instituted March 17th, 1937, and is still being continued. Left arti-

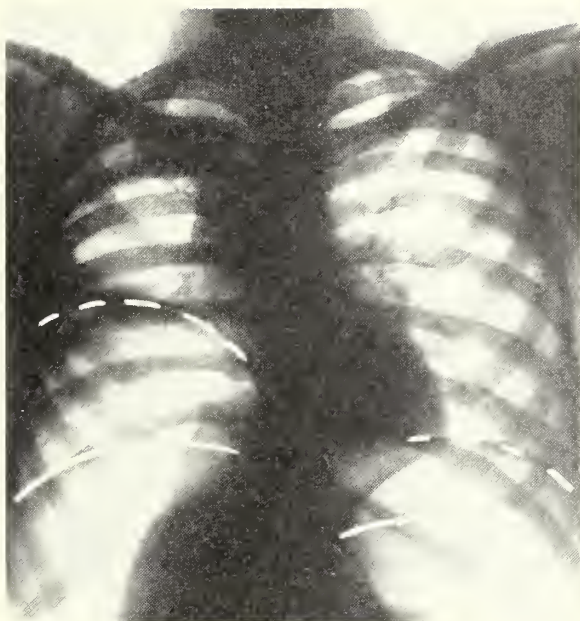


Figure 2—Case 3

After 7 months' treatment, with right phrenic paralysis and pneumoperitoneum, the cavity has closed and there is marked clearing of infiltrations and thickened pleura.

ficial pneumothorax, initiated in 1934 in another sanatorium, is still being maintained here. Left pneumonolysis was done in April, 1936, before admission here. Left phrenic crush done at Olive View 2-15-37, and repeated 1-3-38. Patient is now semi-ambulant, asymptomatic, has no visible cavity and sputum is negative to concentration and animal inoculation. This case illustrates the use of combined procedures of pneumothorax, phrenic paralysis and pneumoperitoneum.

Case No. 2—N. K.—No. 9241—Male, age 34. Admitted to Olive View 12-29-36 (as second admission). Was previously in the sanatorium from May, 1935, to August, 1936, at which time he left against medical advice after refusing to accept pneumoperitoneum. On re-admission he had far-advanced, bilateral involvement with cavity $1\frac{1}{2} \times 2$ cm. in the left upper lobe. Left pneumothorax could not be obtained because of no free pleural space, and left phrenic crush failed to close cavity. Left thoracoplasty was considered, but pneumoperitoneum was given a trial first. Pneumoperitoneum was established January 12, 1937, and is still being maintained. On admission sputum was positive to smear. Sputum became negative to concentration 5 months after pneumoperitoneum was established and has remained negative. Vital capacity before was 50 per cent and afterward 55 per cent. Sedimentation time before was 107 minutes, and 95, afterward. Patient is ambulant, asymptomatic, cavity not visible and thoracoplasty no longer indicated.

Case No. 3—N. H.—No. 9334—Female, age 28. (See Figure 1, before pneumoperitoneum; and Figure 2, after pneumoperitoneum.) Admitted to Olive View 1-27-37. Diagnosis on admission far-advanced, predominantly unilateral, with multiple cavities on the right. Prior to pneumoperitoneum sputum was positive to concentration. Right pneumothorax was ineffectual.

fectual and abandoned after a few weeks' trial because of fluid and loss of space. Right temporary phrenic 3-25-37. Pneumoperitoneum initiated 3-29-37, and still being continued. Sputum became negative to concentration and culture after 5 months and has so remained. Vital capacity was 30 per cent before, and 45 per cent, afterward. Sedimentation time was 11 minutes before, and 47 minutes, afterward. Patient is semi-ambulant, asymptomatic and cavities are closed.

Case No. 4—A. P.—No. 7647—Male, age 21. Patient admitted to Olive View 7-25-34. On admission he had far-advanced, pulmonary tuberculosis, predominantly exudative. X-ray showed the lower part of the right lung field was opaque due to thickened pleura or fluid. Just above the diaphragm was dimly visible a radiolucency measuring $1\frac{1}{2}$ cm., which was suspicious of cavity. Sputum was positive to smear. Eleven years before admission the ninth rib on the right had been resected for empyema. Unsuccessful attempts at right pneumothorax in October, 1934. Right phrenic crush in November, 1934, and permanent phrenic in October, 1935. Pneumoperitoneum instituted 10-26-36 and maintained for eight months here, and is now being continued in one of the Olive View outside sanatoria. Vital capacity was 50 per cent before, and 45 per cent, afterward. Sedimentation time was 112 minutes before, and 76, after.

Basal thoracoplasty on the right had been previously recommended, but not now indicated, as patient has markedly improved; infiltration has cleared and no cavity is visible. At time of transfer to outside sanatorium, sputum was only occasionally positive to 24-hour concentration.

Conclusions

From the facts noted and experience in this series, we feel that the addition of artificial pneumoperitoneum as an accessory measure of compression therapy is rational. This procedure should be used, especially where pneumothorax is impossible or inadequate because of pleuritis or not indicated because of low vital capacity; or where phrenic paralysis is contraindicated or has not caused sufficient rise in the diaphragm to accomplish the desired results. Induced pneumoperitoneum should also be used in postpartum cases where artificial pneumothorax would be considered were the vital capacity sufficient and free pleural space available. In bilateral involvement it should be given a trial, and in cases where more radical measures, such as extra-pleural pneumothorax or thoracoplasty are not indicated because of contralateral involvement, this procedure may cause sufficient improvement in the side with minor involvement to permit of more radical measures on the other side.

A Survey of Tuberculosis Control Work In South Dakota

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IN 1934, a survey of tuberculosis was made in South Dakota. This procedure became necessary because the various organizations which were combatting the disease were obviously not working towards any unified objective. Legislative measures, in effect, resulted in patients having far-advanced pulmonary tuberculosis, and those with long-standing bone lesions, utilizing much of the available hospital space for the treatment of tuberculosis. No definite provisions had been made by any agency, nor by legislation, requiring the testing of animals for tuberculosis. Cattle were consequently unrestricted. Case-finding, although it had been conscientiously pursued in certain districts, was not a state-wide program. Far too many potential cases were dropped after the usual tuberculin test. Organization was not at its best.

The State Sanatorium, although efficiently operated and offering the best of treatment, had in 1934 reached a virtual standstill in its turnover. Patients for whom there was no prospect of medical benefit occupied 40 per cent of its beds. Fifty per cent of the bed capacity was being utilized in hospitalization of moderately

advanced cases. Only 10 per cent of the space was devoted to the so-called incipient type of patients.

The South Dakota Legislature of 1937 made legal provisions for the tuberculin-testing of live stock, and thereby paved the way for South Dakota's entrance in the accredited area. This program, which is being handled through the department of agriculture, marks one of the most forward steps in the control of tuberculosis.

During the period of the survey, some 50,000 examinations were made for tuberculosis. Many of these examinations were made as routine service in physicians' offices throughout the state. For that reason, it is difficult to compile any definite record of the number of active cases actually uncovered within that group.

At the time of the survey the State Health Department sponsored a regulation which required every teacher in the state to furnish a certificate of freedom from active tuberculosis. Fully 5,577 teachers were given the tuberculin test, and at least three of the reactors were found to have clinically active tuberculosis, and were in a definitely infective state.

The South Dakota Education Association was able, at the time of the last legislature, to sponsor a law which

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more or less nullified the State Health Department's regulation requiring certificates of freedom from tuberculosis. This law, by making examination of teachers compulsory, only at the discretion of the local school boards, and incidentally at their expense, has greatly reduced the efficiency of this regulation.

South Dakota's death rate from tuberculosis has been, without a doubt, increased considerably through the prevalence of the disease among the Indians. A comparison of these rates in two representative years, ten years apart, taken at the years of our state census, for the sake of convenience, clearly shows the influence of the Indian death rate.

Comparison of Deaths From Tuberculosis Among White and Indian Population of South Dakota

		Population	Deaths	D. R. per 100,000
1925	Total	681,260	375	55.0
	White	660,701	222	33.6
	Indian	20,559	153	744.2
1935	Total	675,082	273	40.
	White	647,681	155	24.
	Indian	27,401	118	430.

The death rate during the year 1935 of 40 per 100,000 for the whole population, would indicate that there has been a substantial decrease in cases during the ten-year interval. Of no small interest is the indication that the greatest drop in mortality has occurred among the Indians. It is gratifying to note that control measures have shown their effects, even in this group.

The South Dakota State Board of Health is furthering case-finding. Ineffectual clinics in which only the tuberculin test is performed are being supplanted by clinics whose purpose it is to follow the reactors through a complete diagnosis. The State Health Department is attempting, through its officers, nurses and various interested organizations, to educate the people and locate funds which may provide examination and diagnosis by competent physicians.

We feel that the major portion of our work in South Dakota which must be carried on in the future is educational. The people should know of tuberculosis, realize how it spreads, see its devastating effects, and in the final analysis, be shown that it can be controlled.

Newer Knowledge of Eye Health

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I UNDERSTAND that the problems of the Eye Health Committee of the Student Health Association have to do with conservation of vision of students and teachers and the improvement of conditions under which eye work is done. A consideration of these problems requires some knowledge of the anatomical development of the eye, of general physiology and particularly physiology of the eye, and of the function of seeing. To assume that the eye is an organ from which certain things may be expected under standardized conditions is to ignore the fundamental principle of inequality of natural stock from which individuals spring and of the environment in which their development has occurred. While we may set up standards of efficiency under which we may reasonably expect the majority of individuals to function in a similar manner and with similar endurance, we are all cognizant of the tremendous capability of some individuals who have eyes that organically are inferior, but nevertheless do not break down under strenuous work. On the other hand, teachers and physicians are continually confronted with the necessity of making adjustments for persons in apparently perfect health and with organically normal eyes that for one reason or another are unable to maintain ordinary effort. Only certain phases of these problems can be discussed in the short time available at this meeting, but I should like to take this opportunity to point out what appears to me as an ophthalmologist to be the most important items to which this Committee may direct its attention.

Development of the Eye and the Assumption of Visual Function

Ontogenetically, the eye is one of the first parts of the human embryo to show differentiation. Strangely enough, the final development of the eye is not completed until the individual is approximately twenty-five years of age. During the process of development, many changes may be brought about in the eye through deviation, arrest, aberration, constriction, toxemia and disease. The tendency toward hereditary ocular defects is familiar to all students of genetics, but I think we sometimes fail to realize that many of the abnormalities that appear in early and middle life are due to influences which have their beginning in the earliest stages of embryonic development, and either through negative or positive means of action have an almost predictable effect upon the function of an eye of an individual of normal life expectancy. The more severe physical abnormalities result in such conditions as anophthalmos, microphthalmos, coloboma, optic atrophy, cataract and corneal leukoma, all conditions with which ophthalmologists are familiar and conditions which are known to teachers of the blind. The less severe abnormalities, however, may result in only partial loss of function and while constituting a distinct handicap do not make it impossible for one to use the eyes a great deal.

We may divide into five stages the growth and development of the eye in order to bring out more clearly the relationship between organic growth and function and, in a measure, to justify the reasons for setting up

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means of avoiding damage to the eyes through usage or conditions which would render use of the eyes ineffectual. The five stages of development may be indicated as prenatal, infancy, youth or adolescence, maturity and senility.

In the prenatal period occur those changes that are likely to result in maldevelopment of the eye, producing what we usually term hereditary abnormalities. It should be borne in mind, however, that the date of birth is only an incident in the development of the human being and that what occurs shortly before birth or shortly after, to interfere with the proper development of the eye may with equal propriety, be termed congenital accidents. During the entire prenatal period the development of the eyes may be influenced not only by substances which affect the mother but also causes which arise directly within the fetus. For example, all of the endocrine organs of the mother are brought into increased activity during the life of the fetus. As the endocrine organs of the fetus develop and begin to assume their own function, a balance must be set up between the functions of the endocrine organs of the mother as against those of the fetus. Abnormal activity of these glands on the part of the fetus may result in abnormal development of the eyes.

Under certain conditions, the development of the fetus may be materially changed by extraneous forces. The result of the external forces is easily demonstrated in experimental animals of rapid development through the introduction of toxic substances, such as alcohol, mercury or iodine, or by irradiation, particularly by X-rays, or by feeding diets that are deficient in some of the necessary vitamins. Many of the changes resulting from these sources are apparent at birth, but other changes may not appear until several years later.

During infancy the function of the eye develops. The macula is not formed until the infant is about three months of age. Ocular movements depend upon fixation and until the macula is developed the eyes of an infant may not be directed toward an object at will, and it is quite probable that the vision is not acute. During the first three months of life, it is not uncommon to find children's eyes divergent or crossed, not because of any organic defect of the eyes, but because of immaturity. It is doubtful if the further development of the eyes can be materially influenced during this period except by means which would produce tissue trauma. In later months, however, up to the period of three to four years, the function of the eye becomes more highly specialized. It would seem prudent to permit seeing to develop in a natural manner rather than to encourage close application of the eyes through the use of small toys, perusal of pictures and other means of close visual application. During these first two periods, the prenatal and the period of infancy, the eyes are particularly subject to damage from disease. Acute diseases of the mother, such as measles, chicken-pox, scarlet fever, or infections such as septicemia, venereal diseases and tuberculosis may be active in the prenatal period and subject the eye of the embryo to slight or severe damage. Disorders and defects

of the eye that result from diseases of the mother usually are discernible shortly after birth. The same diseases affecting the child may produce exactly similar damage to the eyes, so that in later years it is impossible to determine whether the damage occurred before or after birth, whether any discernible lesion should be considered as congenital or acquired, and, as a matter of fact, it makes no difference.

There are a few disorders and diseases of the eyes that are considered to be hereditary; that is to say, they appear in several members of one family, not only in siblings but in succeeding generations. However, not all ocular defects resulting from these diseases are congenital. For example, such a disease is retinitis pigmentosa, a chronic progressive degeneration of the choroid and retina that makes its first appearance some years after birth and is not amenable to treatment. Many persons affected by retinitis pigmentosa have adequate vision until they are well along in college life. The disease may not be discernible by any test or examination in the earlier years, but cannot escape detection after its progress has become established. Another example of hereditary disease is known as Leber's disease, which consists of degeneration of the retina and optic nerve sometimes associated with mental degeneration and which becomes apparent usually during the school age. Ocular defects and early degeneration are associated with diseases of the endocrine glands that have hereditary influence, such as the Lawrence-Moon-Beadle syndrome. There is also some question as to whether or not we should include in this category glaucoma and myopia. There are certain characteristics of glaucoma that would warrant such consideration. For example, severe glaucoma in the fetus may result in prenatal buphthalmos. Juvenile glaucoma also often results in marked enlargement of the eyeball through increased intra-ocular tension. Influences which act upon the eyeball to increase its size without otherwise interfering with normal development will, of course, result in myopia. Eighty per cent of the children born with apparently normal eyes are hyperopic at birth. Some of these become myopic afterward. The tendency to myopia is undoubtedly more marked in some families than in others, and while it may be regarded as a recessive trait, it may also be considered as an hereditary characteristic. How much change in the development of myopia can be brought about by external influences is a question on which there is considerable divergence of opinion. Whether the course of myopia can be arrested or materially influenced by use of the eyes or by protection of the eyes is not definitely determined.

During the stage of maturity and senility the visual function, for one reason or another, may be expected to decline. In this Committee we are not particularly concerned with the use of the eyes beyond the college age, but if external forces, use or abuse of the eyes in any way determines the function of the eye in the later periods of life, then certainly such influences should be considered.

Ocular disorders during the later school years may be attributed to one or more of four particular influences.

First, let us consider the effect of systemic disease. During adolescence children are susceptible to constitutional diseases, particularly tuberculosis, rheumatism and pluriglandular disease. The age at which symptoms of such diseases develop shows considerable variation. The child that has matured at the age of fifteen may not show significant symptoms or pluriglandular disease until the age of eighteen or twenty. Juvenile tuberculosis may not become sufficiently established to attract attention until in the later teens. Evidences of hereditary lues, particularly interstitial keratitis, retinitis pigmentosa, and optic atrophy, will quite likely appear in the later teen age.

The second most important cause of acquired ocular disorders is focal infection. Among the more significant may be mentioned tonsillitis, dental infection and chronic disease of the middle ear. The director of public health in one of the large universities informed me that he thought one of their most important activities yet to be developed had to do with adequate care of the teeth. The incidence of ocular inflammation from periapical dental infection is well-recognized and it is quite evident that dental infection in youth is much more likely to produce an ocular inflammation than an equally severe dental infection occurring in the later years of life. Transient focal infections do not, as a rule, permit an individual to establish immunity, and repeated infections must be looked upon as repeated insults to the system, and in any single episode of dental infection an eye complication may arise.

Another, but more remote, cause of ocular disorders among people of college age comes about through the use of alcohol and tobacco. Excessive use of either of these substances is reflected in reduction in vision and conjunctival congestion. These substances may act directly on the eyes or indirectly by dulling the sensibilities to such an extent that the eyes will not function properly. The effect on stability of vision, disturbances of ocular motility and interference with accommodation may be seen as transient effects from small amounts of alcohol and tobacco. While normal eyes may well survive repeated insults from these toxic sources, eyes that have previously been injured by disease or are inferior may suffer permanent deleterious effects from comparatively small amounts of such poisons as these. The indirect effect of the excessive use of alcohol and tobacco comes about through malnutrition. Alcohol or tobacco cannot be considered as a substitute for food. Small amounts may stimulate the appetite but excessive amounts, particularly of tobacco, will probably reduce the appetite.

Experiments on animals during the past few years have established beyond any doubt the need of adequate vitamins in a diet of the mother during the early stage of development of the eye. Anophthalmos, microphthalmos and various grades of arrested development of the eyes of pig embryos may be brought about by a diet deficient in vitamins. There is much evidence to indicate

that some of the supposedly congenital abnormalities of hereditary influence in the human have been brought about through insufficient nutrition on the part of the mother. The effects of malnutrition in the adult may not at once be apparent and may be elicited only by special experiments quickly. As a rule, recovery follows inclusion of an adequate amount of vitamins in the diet. There are conditions under which college students live that, to my mind, are extremely important to this Committee on Eye Health. In some of our large universities a few students are living in small rooms, inadequately heated and ventilated, take many of their meals at drug store or lunch wagon counters from food handlers that are not adequately supervised or inspected, and subsist on a diet that is inadequate in one or more of the necessary elements. More and more students are compelled to subsist on pick-up meals either because of inability to find adequate boarding houses or because of economic necessity. I am convinced that in the past twenty-five years, the tendency has been toward inadequate rather than more adequate nourishment among a large proportion of the student population of our larger institutions. There is no question but what smoking is more prevalent, and the drinking of hard liquor is probably more prevalent among students than it was twenty-five years ago. Among college women the desire to remain thin, or, as the English people say, "to practice slimming by light eating" may be a passing fad, but at the present time I think it constitutes one of our greatest health hazards and is one of the most marked influences in the production of headaches and other symptoms which may be referred to the eyes.

The remedy for eye symptoms that may develop through any one of these influences does not lie in the prescribing of glasses or improving the illumination or in any type of treatment applied directly to the eye. The conditions under which ocular disorders develop should be investigated and unfavorable conditions should be corrected. The closest coöperation between the oculist, the student health director and the school is required to bring about better conditions under which students work and live during their college years. Obviously, investigation of students' living conditions is as important as a thorough physical examination, and the circumstances under which the individual student works must be made a part of the medical record.

In schools that have an established student health program, provision has been set up for refraction of those students who have symptoms of eye strain. It is obviously impossible to make a satisfactory and thorough refraction of all students in our larger universities and in many smaller colleges ophthalmologists are not available. We know that it is possible for many students to carry minor refractive errors through years of close application of the eyes without symptoms. I think most ophthalmologists are agreed that such students do not need to wear glasses. This applies particularly to those who are hyperopic and carry a small amount of hyperopic astigmatism. Students who are myopic, of course, need glasses in order to give them more distinct vision

at a distance. It is also believed by many ophthalmologists that the progress of myopia may be retarded or arrested through the constant wearing of glasses which give adequate optic correction. In some institutions, surveys have shown that students who were myopic were not handicapped, but, as a rule, stood in the upper third of the scholastic zone. One explanation for this is that students who are myopic are not adapted for outdoor exercises, are somewhat reticent in participating in extra-curricular affairs because of the necessity for wearing glasses and consequently devote more time to their studies.

The coincidence of refractive errors and muscular anomalies of the eye has, in the past, been considered a concomitant affection which can be corrected by the use of glasses. The fallacy of this situation, however, will be apparent to all who reflect upon the ontogenetic development of the eye and adnexa. The functioning part of the eye has developed from neuro-ectoderm, while muscles and other appendages of the eye develop from mesoderms. Each has its own directing factor, and a disorder of ocular motility may arise without organic defect of the eyeball, or an organic defect of the eye may exist without disturbance of ocular motility. The association of seeing and ocular movements is in itself a coördinated function which is only partly influenced by the use of corrective glasses. Non-medical examiners of the eye who attempt to detect and correct ocular defects are likely to fall into error through ignorance of this association and the factors which influence it. Examinations by incompetent persons with the consequent prescription of corrections which are only partly effective, without an understanding of the complete picture set up by the syndrome of eye strain, constitute one of the great health hazards in the commercialization of glasses. Tests that are made by means of instruments that detect anomalies of certain functions are useful aids but may be misinterpreted and undue significance attached to certain types of results. Unfortunately, not all medically-trained men are sufficiently skilled or experienced in disorders or diseases of the eye to give balanced consideration to the results of these tests, and an apparent division of opinion among medical men leaves an opening for commercial propaganda.

There is only one other line of endeavor of which I wish to speak and which may be seriously considered by this Committee. That has to do with illumination. We do not have definite information as to what permanent effects may follow the use of the eyes under improper lighting conditions, but we do know that glare induces nervousness, irritability and fatigue, and we believe that the same symptoms may be brought about by work under inadequate illumination. The eyes are much more adaptable to insufficient illumination than to glare, and for short periods of time eyes may be used under conditions that vary a great deal from the normal. I believe that surveys and experiments indicate that students are more comfortable and more attentive and can work for longer periods of time without fatigue under illuminations of 5 to 10 foot candles. The conditions under which students work in their rooms and in libraries, in laboratories and in shops, could well be the subject of an intensive survey. Recent issues of pictorial magazines reveal students working in small rooms lighted only by an exposed electric lamp hanging suspended from the ceiling on a long cord, or by a desk lamp from which a glaring light is reflected from the paper to the eyes. Usually the poorest lighting is to be found in the students' libraries and in laboratories where they must work at painstaking reading, drawing or dissecting for many hours a day.

The symptoms of eye strain of students come from a number of sources. They certainly do not all come from errors of refraction. Examination confined to the eyes certainly will not reveal in all cases the fundamental basis of their complaints. I think, therefore, that it becomes an important part of the student health division to inquire into the conditions under which the students live and work. An ophthalmologist should obtain and consider information concerning an environment necessary for an adequate evaluation in any particular case. The student health records, in addition to the data obtained on physical examination, should contain information on the students' diet, habits and living quarters. All students who have symptoms or complaints referable to the eyes should be examined in the light of this complete information.



Iodine in Experimental Tuberculosis*

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THE USE OF IODINE and its salts in the treatment of tuberculosis is by no means new. Efforts have been made in the past to utilize the antiseptic influence of iodine in the hope of destroying the tubercle bacillus within the lesions. But the disastrous results following the use of the iodides (especially potassium iodide) in the treatment of pulmonary tuberculosis have discredited the use of iodine compounds for this purpose. The softening influence exerted upon the caseous cavity walls tends to produce severe hemorrhages, and has led to the discarding of iodine preparations in phthisis.

A study of the recorded literature reveals that the majority of preparations which were used contained appreciable quantities of potassium iodide in addition to elemental iodine. Since potassium iodide is known to exert a deleterious influence on tuberculosis, the thought logically follows that the possible desirable action of elemental iodine may be vitiated by the former. With this in mind, an experimental study was planned whereby the effects of various iodine solutions could be studied regarding their possible prophylactic and therapeutic actions in experimental tuberculosis. Comparative series were observed, using tincture of iodine, Lugol's solution, and aqueous iodine solution No. 1.† A few animals were treated with aqueous iodine solution No. 2,‡ and another group with sodium iodide and hydriodic acid. The aqueous iodine solutions Nos. 1 and 2 were employed because they contained no potassium iodide, and presented an opportunity of observing the influence of

elemental iodine *per se* in this application as compared with solutions of iodine and potassium iodide.

The animals (guinea-pigs and rabbits) were divided into three major groups for comparative study; one series received the iodine in its several forms, in several dilutions for two weeks or more prophylactically, before inoculation with tubercle bacilli; a second series received iodine in the same dosage, simultaneously with inoculation; and a third series was given the iodine at intervals ranging from one to four weeks after inoculation.

The animals were routinely inoculated in the inguinal lymph nodes on the right side, the dosage averaging 500,000 organisms. A smaller number were infected by insufflation into the trachea. Three strains of tubercle bacilli were used—two human types and one bovine. The iodine was routinely administered by mouth, but in a smaller series it was given intravenously and intramuscularly. By mouth the dose varied considerably. Some of the animals received equal volumetric dosage; others were given equal iodine dosage as calculated from the iodine content of the particular solution employed. Controls were run in each group in adequate numbers.

The animals were kept under the same laboratory conditions and fed the same standard diet—grain, pellets, green vegetables and water *ad lib.*—on which the controls normally gained or held their weight, depending upon size and age. For the most part young, growing animals were used because of their greater susceptibility to infection. In the series of guinea-pigs, animals weighed from

TABLE I.
Bactericidal Action of Various Iodine Compounds "In Vitro"

Following Nye's technique of utilizing 5 minutes as the standard test period, various dilutions of the several iodine compounds were tested for their bactericidal action against different types of organisms: viz., *Staphylococcus aureus*, *Streptococcus haemolyticus*, *Bacillus coli*, and *B. diphtheriae*. The solutions are computed on their iodine dilution, rather than their actual dilution, again following Nye's procedures. Fresh 24 hour cultures of the various organisms suspended in normal saline with a concentration of approximately 1,000 million per cc. were used. To 0.5 cc. of such cultures varying dilutions of the iodine compounds were added; the tubes were incubated at 37° C. for 5 minutes and then subcultures in duplicate (again following Nye's technique to avoid any bacteriostatic effect) made on suitable plates. Cultures were examined at the end of 24 and 48 hours.

Compound	Dilution of Compound of Iodine		Staphylococcus	Streptococcus	B. coli	B. diphtheriae
Aqueous Iodine Solution No. 1 Iodine Content 0.78%..... Iodine Dilution 1—128.....	1—4	(512)	No Growth	No Growth	No Growth	No Growth
	1—8	(1024)	No Growth	No Growth	No Growth	No Growth
	1—16	(2048)	No Growth	No Growth	No Growth	No Growth
	1—32	(4096)	No Growth	No Growth	No Growth	No Growth
	1—64	(8192)	Growth	Growth	Growth	Growth
Aqueous Iodine Solution No. 2 Iodine Content 4.43%..... Iodine Dilution 1—22.....	1—32	(704)	No Growth	No Growth	No Growth	No Growth
	1—64	(1408)	No Growth	No Growth	No Growth	No Growth
	1—128	(2816)	No Growth	No Growth	No Growth	No Growth
	1—256	(5632)	Growth	Growth	Growth	Growth
	1—512	(11269)	Growth	Growth	Growth	Growth
Tincture of Iodine..... Iodine Content 7%..... Iodine Dilution 1—14.2.....	1—32	(454)	No Growth	No Growth	No Growth	No Growth
	1—64	(908)	No Growth	No Growth	No Growth	No Growth
	1—128	(1816)	No Growth	No Growth	No Growth	No Growth
	1—256	(3632)	No Growth	No Growth	No Growth	No Growth
	1—512	(7264)	Growth	Growth	Growth	Growth
Lugol's Solution..... Iodine Content 5%..... Iodine Dilution of 1—20.....	1—32	(640)	No Growth	No Growth	No Growth	No Growth
	1—64	(1280)	No Growth	No Growth	No Growth	No Growth
	1—128	(2560)	No Growth	No Growth	No Growth	No Growth
	1—256	(5120)	0 @ 24° + @ 48°	No Growth	No Growth	Growth
	1—512	(10240)	Growth	Growth	Growth	Growth

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† Aqueous iodine solution No. 1, Amend's Solution.
‡ Aqueous iodine solution No. 2, McQuiston's Iodine.

250 to 400 grams; in that of rabbits, animals weighed from 1200 to 1800 grams.

As a preliminary step to this investigation, *in vitro* experiments were undertaken to determine the actual relative bactericidal values of the various iodine compounds under consideration. The usual phenol coefficient type of determinations was made according to Nye's modification.

In addition, similar exposure of tubercle bacilli to varying dilutions of the iodine solutions was carried out; the guinea-pig was used as the test tube to determine whether a comparable bactericidal index as applying to tubercle bacilli could thus be established for the various preparations as well as in culture media.

As a further preliminary step, a series of animals was used to establish the degree of toxicity or tolerability of

TABLE II.

"In Vitro" Bactericidal Action of Various Iodine Compounds Against the Tubercle Bacillus

A suspension of approximately 500,000 tubercle bacilli in 0.5 cc. of saline was exposed to 5 cc. of increasing dilutions of the various iodine compounds for 5 minutes at 37° C., the tubes were rapidly centrifuged, the supernatant solution decanted, the organisms resuspended in 5 cc. of saline, washed again, resuspended and 0.5 cc. of the final suspension injected into the groin and peritoneal cavity of approximately 300 gram guinea-pigs in duplicate. Animals were sacrificed at the end of six weeks and examined grossly and histologically for evidence of tuberculosis. Control cultures on Petroff's medium as well as the animal inoculations were made at the same time from the same final washed suspension, and also from a dilution of the original iodine treated suspension (0.5 cc. of original suspension put into 5.0 cc. of saline and retransferred twice more in the same way, then 0.5 cc. of final dilution used to inoculate medium).

Compound	Dilution		Animal Results	Cultural Results	
	of Compound	of Iodine		Washed Culture	Diluted Culture
Aqueous Iodine Solution No. 1 Iodine 0.78% = an initial dilution of 1-128	1-4	(512)	No Tuberculosis	No Growth	No Growth
	1-8	(1024)	No Tuberculosis	No Growth	No Growth
	1-16	(2048)	No Tuberculosis	No Growth	No Growth
	1-32	(4096)	One Positive — One Negative	Growth	Growth
	1-64	(8192)	Both Positive		
Aqueous Iodine Solution No. 2 Iodine Content 4.43% = an initial dilution of 1-28	1-32	(704)	No Tuberculosis	No Growth	No Growth
	1-64	(1408)	No Tuberculosis	No Growth	No Growth
	1-128	(2816)	No Tuberculosis	No Growth	No Growth
	1-256	(5632)	Both Positive	Growth	Growth
Lugol's Solution Compound Iodine Solution Containing 5% Iodine An initial dilution of 1-20	1-32	(640)	No Tuberculosis	No Growth	No Growth
	1-64	(1280)	No Tuberculosis	No Growth	No Growth
	1-128	(2560)	One Positive — One Negative	No Growth	No Growth
	1-256	(5120)	Both Positive	Growth	Growth
Tincture of Iodine Iodine 7% = an initial di- lution of 1-14.2	1-32	(454)	No Tuberculosis	No Growth	No Growth
	1-64	(908)	No Tuberculosis	No Growth	No Growth
	1-128	(1816)	No Tuberculosis	No Growth	No Growth
	1-256	(3632)	One Positive — One Negative	No Growth	No Growth
	1-512	(7264)	Both Positive	Growth	Growth

TABLE III.

Toxicity of Various Iodine Compounds to Guinea-Pigs

Animals were fed varying amounts of the different iodine compounds in varying dilutions to determine their tolerance for the drug, thus establishing the optimum dose to be employed in the prophylaxis and therapeutics of experimentally induced tuberculosis.

Compound	Dose		Number of Animals	Average Weight at Start	Average Weight at 1 Wk.	Average Weight at 2 Wks.	Remarks
	Min.	cc. mg. I ₂					
Aqueous Iodine Solution No. 1 Iodine Content 0.78%	Undiluted						Used in prophylactic group. Inoculated with 0.5 cc. suspension of tubercle bacilli. Therapy continued.
	5	0.3	2.35	3	336	342	
	10	0.6	4.7	5	327	331	
	16	1.0	7.8	6	346	348	*1 died of aspiration pneumonia. *1 died of aspiration pneumonia.
	32	2.0	15.6	3	342	347	
	80	5.0	36.0	4	383	391	
Aqueous Iodine Solution No. 2 Iodine Content 4.43%	Undiluted						*1 animal died 12th day. Died 8th and 9th days, respectively. *1 dead 5th; other 8th day.
	1.7	0.1	4.43	2	351	354	
	5	0.3	13.3	2	353	359	
	10	0.6	26.5	2	384	326*	Used in prophylactic group. *1 animal dead 9th day. Dead 11th and 12th days, respectively.
	Diluted 1-5.3						
	10	0.6	5.0	6	338	342	
Lugol's Solution Iodine Content 5%	Undiluted						*1 animal died 10th day. Died 9th and 11th days, respectively. *Died 5th and 8th days, respectively.
	1.7	0.1	5.0	4	354	357	
	5	0.3	15	2	308	311	
	10	0.6	30	2	371	356*	Animals used in prophylactic experiments— inoculated with tubercle bacilli. *1 animal died 11th day; other died 18th day.
	Diluted 1-6						
	10	0.6	5	5	357	361	
Tincture Iodine Iodine Content 7%	Undiluted						*1 animal died 11th day. Died 5th and 7th days. Died 3rd and 5th days.
	1.7	0.1	7	2	342	336	
	5	0.3	21	2	327	...	
	10	0.6	42	2	336	...	Animals used in prophylactic experiments— inoculated with tubercle bacilli. *1 animal died 11th day. Died 8th and 12th days.
	Diluted 1-8.4						
	10	0.6	4.9	5	351	354	

Summary: 84 animals were used altogether in this experiment—of these 21 out of 23 (91%) in the series receiving aqueous iodine solution No. 1 survived, whereas in the other groups only 38 altogether out of 61 (62%) survived the initial experimental period, aqueous iodine solution No. 1 being tolerated in much higher amounts.

the various iodine preparations. It was found early in this investigation that even small doses of undiluted Lugol's solution or tincture of iodine proved highly toxic to the animals and could not be administered over any period of time without causing death. On the other

hand, it was found that aqueous iodine solution No. 1 could be used full strength almost indefinitely without any significant mortality. The only fatalities in this group occurred when such large amounts were administered that aspiration pneumonia resulted.

TABLE IV.
Experimental Tuberculosis in Guinea-Pigs—Iodine Before Inoculation†

Animals uniformly inoculated in right inguinal region with 0.5 cc. of a suspension of tubercle bacilli (1,000,000 per cc.) in normal saline. Two strains of human type and one of bovine type organisms used for comparison.

Iodine Preparation	Daily dose in mg. I ₂	Days prophylaxis	No. of animals†	Strain of Tbc. and No. of animals used with each‡	Avge. Weight at start of R	Av. Wt. at time of inoculation	Avge. Weight 2 weeks	Avge. Weight 4 weeks	Avge. Weight 6 weeks	Avge. Weight change in grams	Remarks
Aqueous Iodine Sol. No. 1 Undiluted	2.35	28	3	2H1B	336	357	378	394	407	+71	
	4.70	21	5	3H2B	327	343	358	371	*389	+62	*1 animal dead
	7.80	14	6	4H2B	346	358	363	379	*392	+46	*1 animal dead
	15.60	14	3	2H1B	342	364	372	383	*381	+41	*1 animal dead
Lugol's Solution Diluted 1—6	5.0	21	5	3H2B	357	369	376	307	*226	+131	*3 animals dead
	8.3	14	6	4H2B	362	370	383	254	dead	-108	All animals dead
Tincture Iodine Diluted 1—8.4	5.0	14	5	3H2B	354	359	336	297	*241	-113	*4 animals dead
	8.3	14	5	3H2B	349	351	327	*284	dead	-65	*3 animals dead
Aqueous Iodine Sol. No. 2 Diluted 1—5.3	5.0	14	6	4H2B	342	345	321	*287	dead	-55	*4 animals dead
	8.3	14	4	3H1B	326	308	273	*206	dead	-120	*3 animals dead

†Same animals as used in initial toxicity experiments — see comment in Table II.
‡H = human; B = bovine.

Animals surviving 8 wk. exp. period		Average Weight	Animals surviving 10 wk. exp. period		Average Weight	Comment
No.	%		No.	%		
2	66%	386	1	33%	342	Remaining pig died 73rd day. Small tubercles in spleen and liver. Lungs negative. One pig survived 6 months. Sacrificed. No evidence of Tbc. Both pigs survived 6 months. Sacrificed. No visceral Tbc. Inguinal node fibrotic scars.
3	60%	374	2	40%	353	
4	66%	396	2	33%	378	
1	33%	363	0	....	....	
1	20%	194	0	....	....	Pigs generally showed diffuse miliary tuberculosis
0	....	....	....	....	....	Pigs generally showed diffuse miliary tuberculosis.
1	20%	231	0	....	....	Pigs generally showed diffuse miliary tuberculosis.
0	....	....	....	....	....	Pigs generally showed diffuse miliary tuberculosis.
0	....	....	....	....	....	Pigs generally showed diffuse miliary tuberculosis.

TABLE V.
Experimental Tuberculosis in Guinea-Pigs—Simultaneous Iodine Medication

Animals uniformly inoculated in right groin with 0.5 cc. of a saline suspension (1,000,000 per cc.) of tubercle bacilli. Same strains of organisms used as in preceding experiment. Various forms of iodine administered in different dosage daily, commencing day of inoculation. Medication per os.

Iodine Preparation	Daily dose mg. I ₂	No. of animals	Strains used and number of animals each	Animals surviving 6 wk. exp. period		Animals surviving 8 wk. exp. period		Animals surviving 10 wk. exp. period		Animals surviving 12 wk. exp. period	
				No.	%	No.	%	No.	%	No.	%
Aqueous Iodine Solution No. 1 Diluted 1—10. Undiluted. Undiluted. Undiluted.	0.47	10	8H 2B	9	90%	6	60%	1	10%	0	....
	2.35	10	8H 2B	10	100%	6	60%	2	20%	0	....
	4.70	25	20H 5B	23	92%	19	76%	9	36%	2	8%
	7.80	25	20H 5B	22	88%	21	84%	13	52%	6	24%
Lugol's Solution Diluted 1—60. Diluted 1—6. Diluted.	0.50	10	8H 2B	6	60%	2	20%	0	....	..	....
	5.00	20	15H 5B	11	55%	3	15%	0	....	..	....
	8.30	25	20H 5B	12	28%	3	12%	0	....	..	....
Tincture Iodine Diluted 1—84. Diluted 1—8.4. Diluted.	0.50	5	4H 1B	2	40%	0	....	0	....	..	....
	5.00	5	4H 1B	2	40%	1	20%	0	....	..	....
	8.30	5	4H 1B	1	20%	0	....	0	....	..	....
Aqueous Iodine Solution No. 2 Diluted 1—53. Diluted 1—5.3. Diluted.	0.50	5	4H 1B	2	40%	1	20%	0	....	..	....
	5.00	5	4H 1B	3	60%	0	....	0	....	..	....
	8.30	5	4H 1B	1	20%	0	....	0	....	..	....
Hydriodic Acid.	5.00	5	4H 1B	2	40%	1	20%	0	....	..	....
Controls.	None	15	10H 5B	7	40%	2	10.6%	0	....	..	....

The following tables represent in condensed and tabular form the results of the experimental work. Careful perusal brings out the significant features of the study. Because of lack of space, and because of the marked variation in the individual animal's reactions, it did not

seem advisable to present the individual protocols in detail.

Discussion

From the above data, certain conclusions may be drawn. Standard tincture of iodine and Lugol's solution

TABLE VI.
Experimental Tuberculosis in Guinea-Pigs—Post-Inoculation Iodine Therapy

Animals uniformly inoculated in right groin with 0.5 cc. of a saline suspension (1,000,000 per cc.) of tubercle bacilli. Same strains of organisms used as in preceding experiments. Dosage and time interval of medication varied as summarized below. Medication per os.

Iodine Preparation	Daily dose mg. I ₂	Days post inoculation medication started	No. of animals	Strain used and number of animals each	Animals surviving 6 wk. exp. period		Animals surviving 8 wk. exp. period		Animals surviving 10 wk. exp. period		Animals surviving 12 wk. exp. period	
					No.	%	No.	%	No.	%	No.	%
Aqueous Iodine Sol. No. 1												
Diluted 1—10.....	0.47	10	10	8H 2B	8	80%	7	70%	3	30%	0	....
Diluted 1—10.....	0.47	20	10	8H 2B	6	60%	4	40%	1	10%	0	....
Diluted 1—10.....	0.47	30	10	8H 2B	3	30%	2	20%	0	....	0	....
Undiluted.....	4.70	10	10	8H 2B	8	80%	8	80%	4	40%	2	30%
Undiluted.....	4.70	20	15	10H 5B	8	53%	6	60%	2	20%	1	10%
Undiluted.....	4.70	30	5	4H 1B	3	60%	1	20%	0	....	..	....
Lugol's Solution												
Diluted 1—60.....	0.50	10	10	8H 2B	6	60%	2	20%	0	....	0	....
Diluted 1—60.....	0.50	20	10	8H 2B	4	40%	2	20%	0	....	0	....
Diluted 1—60.....	0.50	30	10	8H 2B	3	30%	0	....	0	....	0	....
Diluted 1—6.....	5.00	10	10	8H 2B	6	60%	3	30%	1	10%	0	....
Diluted 1—6.....	5.00	20	15	10H 5B	5	53%	2	13%	0	....	0	....
Diluted 1—6.....	5.00	30	5	4H 1B	2	20%	0	....	0	....	0	....
Controls.....	....	..	10	6H 4B	4	40%	2	20%	0	....	0	....

TABLE VII.
Experimental Tuberculosis in Guinea-Pigs—Effect of Iodine Administration

Miscellaneous experimental data—iodine injected intravenously and subcutaneously—insufflation-induced tuberculosis with human strains.

Iodine Preparation	Daily dose in mg. I ₂	Method of inoculation	Days after inoculation therapy started	Method of treatment	No. of animals	Animals surviving 6 wk. exp. period		Animals surviving 10 wk. exp. period		
						No.	%	No.	%	
Aqueous Iodine Sol. No. 1	4.7	Insufflation	10	Intravenous	8	6	75%	2	25%	
Undiluted.....	4.7	Insufflation	10	Subcutaneous	8	7	87.5%	3	37.5%	
Lugol's Solution.....	5.0	Insufflation	10	Intravenous	8	0*	....	0	....	*Animals all died within 2 weeks. **Remaining Animals emaciated and almost moribund at 6 wk. period. Sloughing abscesses.
Diluted 1—6.....	5.0	Insufflation	10	Subcutaneous	8	2**	25%	0	....	
Tincture Iodine.....	5.0	Insufflation	10	Intravenous	5	0*	....	0	....	
Diluted 1—8.4.....	5.0	Insufflation	10	Subcutaneous	5	1**	20%	0	....	
Aqueous Iodine Sol. No. 2	5.0	Insufflation	10	Intravenous	5	0*	....	0	....	
Diluted 1—5.3.....	5.0	Insufflation	10	Subcutaneous	5	1**	20%	0	....	
Sodium Iodide.....	5.0	Insufflation	10	Intravenous	3	1	33%	0	....	
	5.0	Insufflation	10	Subcutaneous	3	2	66%	1	33%	
Controls.....	..	Insufflation	..	.....	10	3	30%	0	....	

TABLE VIII.
Experimental Tuberculosis in Rabbits—Effect of Various Iodine Preparations

On the basis of the initial experimental results obtained with guinea-pigs, a similar series of rabbits was inoculated intraperitoneally with 1 cc. of the suspension (1,000,000 organisms per cc.) of one of the human strains of tubercle bacilli (ST 576) and put on standardized iodine dosages of approximately 1 or 10 mg. per kilo (1.5 and 15.0 mg. routinely) ten days following inoculation.

Iodine Preparation	Daily dose in mg. I ₂	No. of animals	Animals surviving 8 wk. exp. period		Animals surviving 10 wk. exp. period		Animals surviving 12 wk. exp. period		Remarks
			No.	%	No.	%	No.	%	
Aqueous Iodine Sol. No. 1									
Diluted 1—10.....	1.56	15	8	53%	6	40%	2	13%	Died 13th and 14th wks. Small, relatively healed tubercles. Three animals survived 6 mo. period. Sacrificed. No evidence of tuberculosis.
Undiluted.....	15.60	25	17	68%	14	56%	5	20%	
Lugol's Solution									
Diluted 1—60.....	1.50	15	6	40%	2	13%	0	....	Died of diffuse miliary tuberculosis. Lesions typical in appearance, size and distribution.
Diluted 1—6.....	15.00	25	11	44%	4	16%	0	....	
Tincture Iodine									
Diluted 1—84.....	1.50	6	1	16%	0	....	0	....	Animals died of typical diffuse tuberculosis. Unaffected by medication.
Diluted 1—8.4.....	15.00	12	3	25%	1	8%	0	....	
Controls.....	..	10	4	40%	1	10%	0	....	Typical diffuse tuberculosis in all animals.

are definitely bactericidal *in vitro* as far as tubercle bacilli are concerned. But in the effective bactericidal dosage they are obviously unsuited for oral, intravenous or subcutaneous use, as they are toxic and are poorly tolerated by the experimental animal. Intravenously they promptly cause death except when highly diluted. Subcutaneously, in very high dilution, they usually lead to abscess formation with sloughing ulcers. No appreciable change in the course of the disease, nor in the development of the tubercle is noted in the animals which survive the usual four to six week period used routinely for diagnostic purposes. The lesions are not influenced either as to size or number. Furthermore, after holding their weight for a period of only one to two weeks, the animals regularly showed progressive weight loss and usually died in an emaciated condition well within the usual six week experimental period. This emaciation as a rule was much more marked than in the control animals injected routinely with tubercle bacilli and not subjected to iodine therapy in any form. These observations further strengthen the hypothesis that tincture of iodine and Lugol's solution, even in small dosage, exert a toxic, harmful, lethal effect in normal animals, and hasten the death of tuberculous animals.

On the other hand it will be noted that the animals treated with aqueous iodine solution No. 1 presented a strikingly different reaction. The *in vitro* experiments show that the aqueous iodine solution is fully as effective in its bactericidal influence as the tincture or Lugol's solution, when used in comparable iodine content dilutions. This fact has been corroborated by the recent report of Nye.

It is worthy of note that comparable iodine dosage with aqueous iodine solution No. 1 *per os* was far better tolerated by the animals, suggesting that in the course of its preparation the iodine in some manner is combined in a less toxic form. This is purely speculative, as its chemical analysis merely gives its total iodine content—0.78 per cent. However, it cannot fail to be impressive that the control animals in the toxicity experiments, even with a daily dosage of as much as 10 cc. of the undiluted solution (78 mg. I_2), continued to gain weight throughout an experimental period of at least three to four weeks, whereas the guinea-pigs receiving 1.0 cc. of undiluted Lugol's solution (50 mg. I_2) daily or 10 cc. of a 1 : 6.0 dilution (giving an equivalent of 78 mg. I_2 daily) usually succumbed within a few days.

Experimentally it was found that the most practical routine dosage was ten minims (0.6 cc.). All the animals were given iodine individually by dropper or pipette to insure accuracy of dosage, after it was found that their individual food and fluid intake varied too much to mix the medication with the food or water. The iodine values were calculated on an I_2 content of 7.0, 5.0 and 0.78 per cent for the tincture, Lugol's solution, and aqueous iodine solution No. 1, respectively. After the initial experiments to determine toxicity and tolerability, the dosages were established routinely on the basis of the undiluted solution and a one to ten dilution. This

gave the equivalent of approximately 5.0 mg. or 0.5 mg. of iodine per day. With the tincture and the compound iodine solution (Lugol's) initial dilutions of 1 : 8.4 and 1 : 6 respectively gave approximately equivalent 5 mg. doses. On the basis of an average initial weight of 350 grams this makes a dose of roughly 15 mg. per kilo which is about five times the usual maximum dose used therapeutically in man, and more nearly ten times the average dose. Accordingly, the higher dilution giving 0.5 mg. or 1.5 mg. per kilo is perhaps better comparable with the established clinical use of iodine internally.

Summarizing so far as possible the results of the use of aqueous iodine solution No. 1 in experimental tuberculosis, the evidence points very strongly to its value both prophylactically and therapeutically. In no sense of the word can it be considered as in any way specific in its action, but it is indisputable that the animals receiving an adequate dosage (averaging 5 mg. per day) prophylactically, ran a very much modified course. The disease was delayed in its clinical manifestations as compared with the behavior of control animals and of those on Lugol's solution or tincture—the animals lived an average of ten to twelve weeks; in a few instances they were still alive and apparently healthy, with no evidence of the disease, as much as six months later.

Likewise the lesions which did develop were smaller, fewer in number and much less caseous in character. Healing, fibrosis, and calcification occurred much more frequently in the group treated with aqueous iodine solution No. 1 than in the others. In the animals which survived a six month period and were sacrificed, it was difficult to find any evidence of tuberculosis except at the site of inoculation. Histologically these areas showed little evidence of activity, being practically healed. By the usual fuchsin stain only an occasional tubercle bacillus could be demonstrated, and reinoculation of a sub-

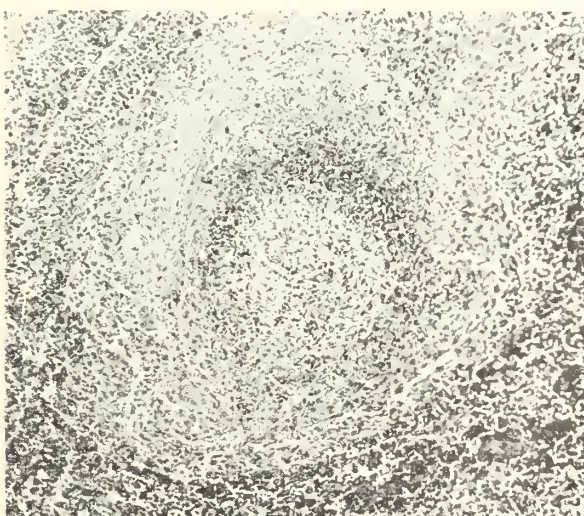


Fig. 1

Spleen: Guinea-pig—dying spontaneously of tuberculosis eight weeks after inoculation with tubercle bacilli. Treatment with 5 mg. of I_2 (as compound iodine solution [Lugol's]) daily. Note typical caseous necrosis and tubercle formation.

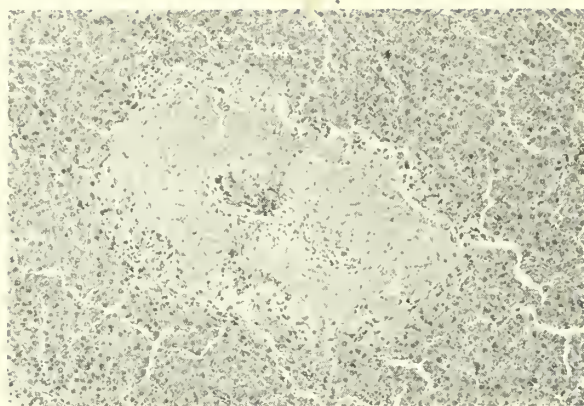


Fig. 2

Liver: Guinea-pig—sacrificed twelve weeks after inoculation with tubercle bacilli. Treatment with 4.7 mg. of I_2 (as aqueous iodine solution No. 1) daily. Note extensive healing and fibrosis of lesion as compared with the active process in Fig. 1.

series of animals from 11 such guinea-pigs failed to induce tuberculosis.

The therapeutic superiority of aqueous iodine solution No. 1, and the animals' greater tolerance for it, are perhaps as well exemplified by the weight curves of the animals as by any other criterion. As the tables indicate, the animals on the tincture or Lugol's solution rarely held their weight for more than ten days to two weeks, showing a relatively steady weight loss thereafter until death. Even in the initial toxicity and tolerability tests this weight loss was apparent. On the other hand, animals treated with aqueous iodine solution No. 1 maintained proper weight curves, and normal growth increases occurred regularly for six to eight weeks. In a considerable number of the animals, although the weight curves then tended to flatten out, weights were maintained or bettered at the end of the experimental period, or were maintained up to a few days before death, when a relatively rapid weight loss took place. Occasional exceptions to these general trends were found in all the variously treated groups.

While one must be guarded in attempts to interpret and evaluate data of this type, the results obtained in this series of experiments indicate that it is not solely a question of iodine content which accounts for the differences. With comparable iodine dosage, animals inoculated with tuberculosis died within a month or six weeks or less, with the disease unmodified when treated with tincture of iodine, with Lugol's solution, with aqueous iodine solution No. 2, or with sodium iodide.

On the other hand, when treatment with aqueous iodine solution No. 1 was started simultaneously with the inoculation, even in one-tenth the equivalent dose, the course of the disease appeared materially prolonged, and the lesions were smaller in size and fewer in number; if treatment was started subsequent to the inoculation, the lesions were smaller, and showed greater evidence of attempted healing; in both groups the general nutritional state of the animals appeared much better.

Two possibilities present themselves which might explain the observed results. One may assume that in the preparation of aqueous iodine solution No. 1, a change

occurs in the iodine which renders the preparation less toxic, and apparently, in the prophylaxis and treatment of experimental tuberculosis, more effective than tincture of iodine or Lugol's solution. The second postulate assumes that the known toxic effects of potassium iodide, which is contained in both the tincture and in Lugol's solution, vitiates the possible beneficial influence of their elemental iodine content.

Summary

A comparative study of the influence of various iodine compounds upon experimental tuberculosis in a series of 487 guinea-pigs and 108 rabbits is presented. The iodine products included tincture of iodine, compound iodine (Lugol's) solution, two aqueous iodine solutions free of potassium iodide, sodium iodide, and hydriodic acid.

Initial experimental data on the bactericidal value of these products and of their toxicity were obtained to find the optimum dosage in each case. A calculated daily dose of 15 mg. of iodine per kilo was established as the routine procedure, with one-tenth of this or 1.5 mg. per kilo in a small series of animals for comparative uses.

The tolerance for these products showed striking differences. Tincture, Lugol's, and aqueous iodine solution No. 2 were badly tolerated even in the smaller established dosage. Their influence on the course of the induced tuberculosis was negligible; indeed, most of the animals died in a shorter time than the untreated controls. Aqueous iodine solution No. 1 on the contrary was well tolerated even in large doses over periods of eight and ten weeks. The tuberculous lesions were smaller, fewer in number, and showed a striking tendency to heal in the animals given the drug prior to or simultaneously with the tubercle bacillus inoculation. The course of the disease was likewise lengthened in the animals in which treatment was started within two or three weeks after inoculation. Several of the animals showed practically complete healing of the lesions at the end of a six-month period. Under treatment with aqueous iodine solution No. 1 the weight curves were maintained or showed a normal increase in the great majority of the animals over an eight to ten-week period, while progressive weight loss occurred after the first ten days or two weeks in the animals treated with the other preparations.

Two theoretical possibilities are postulated to explain this difference in behavior between the various iodine solutions studied.

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WHAT 1938 PROMISES IN THE CONTROL OF TUBERCULOSIS

THE JOURNAL-LANCET again coöperates with the National Tuberculosis Association in its early diagnosis campaign during the month of April by publishing a special tuberculosis issue. The articles in this number were written by physicians in both small and large communities from the Atlantic to the Pacific seaboard. Some are engaged in sanatoriums; others in health departments, and still others in private practice, so the reader will have the advantage of different points of view in the various localities. The papers range from those which deal with a single new therapeutic procedure through the various standardized therapeutic and diagnostic methods, to well rounded-out programs designed to control tuberculosis in entire cities and states.

The work of the veterinarian and closely allied groups is represented in the article by Dr. Mohler, which presents the most effective control of tuberculosis known to man. This demonstration is a challenge to the medical profession. The veterinarian has charted the course for us. The tuberculin test which he found so specific in cattle is no less specific in man. The interpretation of the positive reaction is the same in the two instances, namely, that the primary tuberculosis complex exists and contains living tubercle bacilli. Such a complex is a menace to the individual body, since it may provide bacilli for the development of clinical lesions. In so doing, it becomes a menace to other animals of the herd or to the associates of the person who has it. The veterinarian solves the problem by destroying the primary complex through slaughter of the animals. He does

this even in the absence of clinical disease because experience has taught him the potentialities of the primary complex.

The physician knows of the potentialities of the primary tuberculosis complex, as revealed by the positive tuberculin reaction, and his methods of dealing with it are equally effective. He examines periodically all positive tuberculin reactors for the appearance of clinical disease, which if undetected and untreated may eventually cause invalidism and death and spread to other persons in whose bodies cultures of tubercle bacilli develop. If the disease is already communicable when found, the physician immediately treats or recommends isolation in a hospital or sanatorium, where the patients no longer spread tubercle bacilli except to the personnel and visitors in the institution. Technic in the care of institutional patients will even prevent this danger. As far as the public health of the community is concerned, dealing with a tuberculous patient in this manner is as effective as the veterinarian's method.

Large numbers of tuberculous patients are now being treated in homes, hospitals, and sanatoriums, with such effectiveness that the disease does not become communicable, or if it is already communicable, and treatment is begun, it is quickly rendered non-communicable. Such treatment is more effective than the veterinarian's, for it not only removes the dangers from contagion but also restores the individual to a good working capacity. The program of control of tuberculosis among human beings is now standardized and practiced. All that is necessary to reduce tuberculosis to a minor disease is to use everywhere what we already know about tuberculosis.

J. A. M.

THE PHYSICIAN IN NOVELS

A noted Scotch physician-author has gained additional fame by means of his latest novel, which among other things depicts the life of a notorious type of doctor. Against the public acclaim given this book have been indignant comments from some of the profession in this country, and also from some of the reviewers. Like many another book that has achieved a dubious fame by lambasting the physician or by introducing a decided sex element, the book by this Scotch physician is going to be produced as a motion picture. Not long since, this physician spoke *via* the radio networks from New York City, and his talk was intended for English as well as American ears. It may be that this radio talk was to be utilized by the motion picture producers.

A pleasant antidote, at least to some extent, is a review which appeared in the Manchester *Guardian Weekly* of England, for December 31, 1937. Some critic named G. J. discusses a book dealing with the career of a beloved earnest English physician and surgeon who willingly sacrificed his life professionally during Italy's diabolical warfare against the Ethiopians:

"John Melly was a Marlborough schoolboy, an M.C. in France at twenty, an Oxford graduate, and an Edinburgh F.R.C.S., who, to gain greater medical and surgical experience, walked the wards both at Bart's and at Ann Arbor, Michigan. He was a youth in whom the elements were oddly mixed. An ardently religious man, he danced and boxed as well as prayed. A good deal of a dandy, famous at Oxford for his ties and waistcoats, he would preach in the open air 'with all the fervor and simplicity of a Salvationist'. He would devote a strenuous afternoon teaching boxing to a group of poor lads. The festive instinct was as much a part of him as the deeper motives by which the whole of his short life was ruled, and he managed, with little apparent clash, to reconcile them. His great ambition was to be a medical missionary, and eventually his chance came in Ethiopia, with the outbreak of war there. Twice before he had visited the country, and in 1935 he set out again in charge of an ambulance unit raised almost entirely by his own efforts. Six months later he met his death in one of the wild scenes which broke out in the streets of Addis Ababa on the eve of the Italian entry.

"As might be expected, Melly had some scathing things to say in his letters and communiqués, both about the policy which led to the war, and Italy's conduct of it. 'That civilized nations can sit back and without a word of protest watch Italy's blatant action', he wrote before the actual outbreak of hostilities, 'should bring a blush to every white cheek in the world . . . for you see, Italy wants Abyssinia'.

"When war came, it was the old story of human devilry let loose. On one occasion, when he and his colleagues were ministering to their patients in a camp marked by two huge Red Cross ground flags, an Italian plane flew low over it about 9 times, raining destruction and death on every side. There was no possible question of doubt, Melly wrote, about the absolute deliberation

of the attack. 'This is not war!' he burst out again, 'It's the torture of tens of thousands of defenseless men, women and children with bombs and poison gas. They are using gas incessantly, and we have treated hundreds of cases, including infants in arms,—and the world looks on, and passes by the other side!'

"But the final impression with which one lays down this unpretentious narrative* is not one of the stupid ferocity of modern warfare; but of the bright, light-hearted servant of God and lover of man whom it reveals to us . . . It will be something if his story stops the mouth of those who talk lightly of the 'decadence' of the youth of Britain; it will be a still greater thing if, through it, youth's hands and feet are made 'quicker unto good'."

* John Melly of Ethiopia, edited by Kathleen Nelson and Alan Sullivan; London, England, Faber & Faber, Ltd.: 1937. Price, 8 shillings, sixpence.

A. W. S.

D'ANNUNZIO

Many pleasant acquaintances have been made while leisurely smoking an evening cigar in the men's end of a Pullman sleeper. On one such occasion a gentleman who boarded the train at Asheville, North Carolina, the "land of the sky," betrayed his profession by perusing a copy of the *Archives of Internal Medicine*. It was natural under the circumstances to comment on the heavy nature of his *reise literatur*, thereby engaging him in a conversation that proved interesting. He had been a major during the World War and had recently returned from service in Italy.

Our topic soon turned to D'Annunzio's leadership, and to his dramatic ability of inspiring his troops. The major recounted one anecdote in particular that illustrated this point. In a certain speech to his men, D'Annunzio's gift of playing upon the Latin emotion was climaxed by this appeal: "Men of Rome, somewhere up there in the azure blue the legions of the Caesars are watching over you! Can you not with your mind's eye see them? Can you not hear their tread? Listen! *hic, hoc; hic, hoc; left, right!* They are again marching; they are watching to see what you will do. They expect you to live up to their tradition! They are waiting for your answer."

He aroused their imagination and stirred them to a frenzy of patriotic zeal that no opposing force could withstand.

Would it not be interesting to speculate in a like manner on the great leaders in medicine that have gone before? We do not need to go back to antiquity: Lister in England, Pasteur in France, Billroth of Swedish birth in Germany, Virchow in Austria, Semmelweis in Hungary, and many in our own country; these partly constitute the medical legions that have passed from the active stage to watch and hope that their successors will live up to their code.

A. E. H.

Future Meetings

**TENTATIVE PROGRAM OF THE
SOUTH DAKOTA STATE MEDICAL ASSOCIATION
57th Annual Session, Huron,
Marvin Hughitt Hotel**

May 9, 10, and 11, 1938

The following is the program of the South Dakota State Medical Association, 57th Annual Session, to be held in Huron, May 9, 10, and 11, 1938, at the Marvin Hughitt Hotel.

May 9, 1938

- 4 p. m. First meeting of the Council.
- 7 p. m. First meeting of the House of Delegates.

May 10, 1938

- 8:30—9:30 Obstetric Clinic, Dr. E. D. Plass, professor of obstetrics and gynecology, University of Iowa, Iowa City, Iowa.
- 9:30—10:30 Dermatological Clinic, Dr. H. E. Michelson, professor of dermatology and syphilology, and director of division, University of Minnesota Medical School, Minneapolis, Minnesota.

INTERMISSION

- 11:00—12:00 Medical Clinic, Dr. S. Marx White, professor of medicine, University of Minnesota Medical School, Minneapolis, Minnesota.

NOON

- 1:20—1:40 Address, Dr. E. A. Pittenger, president, South Dakota State Medical Association.
- 1:40—2:10 "Obstetric Syphilis," Dr. Plass.
- 2:10—2:40 "The Doctor in Health Education," Dr. W. W. Bauer, director, bureau of public health and public instruction, American Medical Association, Chicago, Illinois.
- 2:40—3:10 "Dermatological Diagnosis for the General Practitioner," Dr. Michelson.

INTERMISSION

- 3:30—4:00 Lecture on medicine, subject to be announced, Dr. White.
- 4:00—4:30 "The Relation of Tears to Some Common Eye Diseases," Dr. C. Wilbur Rucker, assistant professor of ophthalmology, Mayo Foundation, Rochester, Minnesota.
- 6:15 p. m. Annual Banquet.
- 8:15 p. m. Public Meeting—"Popular Beliefs That Are Not So," Dr. W. W. Bauer.
- 10:00 p. m. Second meeting of the House of Delegates. Address by the president-elect, Dr. J. F. D. Cook, Langford.

May 11, 1938

- 7:00 a. m. Second meeting of the Council.
- 8:30—9:30 Rectal Clinic. Dr. Walter Fansler, associate clinical professor of surgery, University of Minnesota Medical School, Minneapolis, Minnesota.
- 9:30—10:30 Surgical Clinic. Dr. Virgil S. Counsellor, assistant professor of surgery, Mayo Foundation, Rochester, Minnesota.

INTERMISSION

- 11:00—12:00 Pediatric Clinic. Dr. H. F. Helmholtz, professor of pediatrics, University of Minnesota Graduate School of Medicine, Rochester, Minnesota.

NOON

- 1:30—2:00 "Diagnosis and Office Treatment of Rectal Diseases," Dr. Walter Fansler.
- 2:00—2:30 "The Physiology of Hypertension," H. M. Sweeney, Ph.D., professor of physiology, University of South Dakota School of Medicine, Vermillion, South Dakota.
- 2:30—3:00 "The Uterus as a Surgical Problem in General Practice," Dr. Virgil S. Counsellor.

INTERMISSION

- 3:20—3:50 "The Value of the X-ray in Diagnosis," Dr. Charles G. Sutherland, assistant professor of radiology, University of Minnesota Graduate School of Medicine, Rochester, Minnesota.
- 3:50—4:20 "Recent Advances in the Treatment of Urinary Infections in Childhood," Dr. Helmholtz.
- 4:20 p. m. Conference on roentgenologic diagnosis. Films to be furnished by members of the association. Dr. Sutherland.

**South Dakota Academy of Ophthalmology
and Otolaryngology**

May 10, 1938

- 9:00 a. m. Dr. J. D. Alway, Aberdeen: "Foreign Proteins in Eye Therapy."
- 10:00 a. m. Dr. G. M. Constans, Bismarck, North Dakota: "Management of Squint."
- 11:00 a. m. Dr. L. R. Boies, Minneapolis, Minnesota: "The Modern Uses of Endoscopic Procedures."
- 12:00 a. m. Dr. C. W. Rucker, Rochester, Minnesota: "The Visual Pathways."

Dr. E. A. Pittenger, president of South Dakota State Medical Association, together with Dr. B. A. Dyar, Pierre, executive secretary, and Dr. C. E. Sherwood, Madison, secretary-treasurer, plan a visitation of several of the districts during the last week in March. Their itinerary includes: district meeting, Monday evening, March 28, 6:30, Grand Hotel, Watertown; a noon-day meeting with the Third District, Madison, on Tuesday, March 29; a Seventh District meeting in Sioux Falls, Tuesday evening, 6:30, Cataract Hotel; a luncheon conference with the officers of the Yankton District at Yankton, March 30; a dinner meeting with the Sixth District in Mitchell, March 30; a luncheon meeting with the officers of the Pierre District at Pierre, March 31, and a dinner meeting with the Huron District, Huron, March 31.

Dr. E. A. Pittenger, president, Dr. B. A. Dyar, executive secretary, and Dr. C. E. Sherwood, secretary-treasurer, of the South Dakota State Medical Association, were in attendance at the Northwest Regional Conference in Chicago in February, 1938.

CLARENCE E. SHERWOOD, M.D., *Secretary*,
South Dakota State Medical Association.

**HOUSE OF DELEGATES,
MEDICAL ASSOCIATION OF MONTANA**

Postgraduate Clinics in Montana

POSTGRADUATE CLINICS IN MONTANA

The House of Delegates of the Medical Association of Montana will convene at Livingston on April 26, 1938.

Three postgraduate meetings will be held in Montana during April; the first at Miles City on April 25 and 26; the second at Livingston on April 27 and 28; the third at Missoula on April 30 and May 1. Speakers are M. G. Peterman, M.D., professor and director of the department of pediatrics in Marquette University, Milwaukee; M. Edwards Davis, M.D., associate professor of obstetrics and gynecology, University of Chicago; and Francis W. Lynch, M.D., assistant professor of dermatology, University of Minnesota. One public meeting will be held at Missoula on April 30, on "Syphilis".

The American Association for the Study of Goiter will meet in Washington, D. C., September 12 to 14, 1938. This will be the Third International Goiter Conference. Physicians interested should write to Dr. Allen Graham, chairman of the program committee, 2020 East 93rd Street, Cleveland, Ohio.

American Congress on Obstetrics and Gynecology

Preparations for holding the American Congress on Obstetrics and Gynecology are proceeding, several meetings having been held by the members and directors of the American Committee on Maternal Welfare, Inc., to develop the arrangements for convening the congress in Cleveland during the week of September 11, 1939. Cleveland was selected as offering an easily-reached central point with adequate hotel facilities and suitable meeting and exhibition space in the Convention Hall.

The congress has been organized to include the interests of various groups of participants, such as medical educators, physicians, nurses, public health workers, hospital administrators, and others interested in the problems of human reproduction. The morning sessions are allotted for the presentation of scientific and technical papers in each group; in the afternoons mixed groups will participate in general discussions, and the evening sessions will be for the public, probably with broadcasts.

In addition there will be commercial and scientific exhibits developed to illustrate the work of various public and private agencies, and of individuals engaged in scientific activities pertaining to human reproduction. Those exhibits of a commercial character, as of instruments, books, apparatus, medicinal preparations, etc., will be of a high character and ethical in presentation.

An executive office devoted to the management of the Congress has been opened at The Annex of the American College of Surgeons, 650 Rush Street, Chicago, in charge of the general chairman, where all inquiries may be addressed.

News Items

New officers of the Sixth District Medical Society of North Dakota are: Dr. Otto C. Gaebe, New Salem, president; Dr. George Robert Lipp, Bismarck, vice president; Dr. Leonard W. Larson, Bismarck, secretary-treasurer; Dr. Frederick B. Strauss, Bismarck, censor; and Dr. Oscar T. Benson, Glen Ullin, and Dr. Reuben H. Waldschmidt, Bismarck, delegates to the state medical convention. Dr. H. A. Brandes, Bismarck, is chairman of the society's committee which will plan the entertainment of the state medical convention when that body meets in Bismarck, in May, 1938.

Dr. Robert Gillam White, formerly of the Ann Arbor public school system in Michigan, is the new chief of a district branch of the North Dakota State Department of Health established at Valley City. The territory under Dr. White's supervision comprises Barnes, Stutsman, Ransom, LaMoure, Sargent and Dickey Counties.

The city of Granite Falls in Minnesota has a new clinic operating in connection with the Granite Falls Hospital. It is composed of Dr. Melvin S. Nelson and Dr. Anton G. Sanderson of Granite Falls, and Dr. Paul G. Schmidt, Jr., of Cottonwood, who is president of the Lyon-Lincoln Counties Medical Society.

Dr. Paul P. Ewald, Lead, S. D., was chosen president of the Black Hills Medical Society at the meeting in Deadwood on December 16, 1937. Dr. Henry E. Davidson, Lead, was elected vice president; and Dr. Roy E. Jernstrom, Rapid City, is the new secretary-treasurer. Dr. Frank Stewart Howe, Deadwood, and Dr. Davidson demonstrated the new Drinker respirator which has been presented to the society by the American Legion, after its presentation by Dr. Guy F. Zarbaugh, of Deadwood. The respirator was purchased in Boston at a cost of \$1,350. It will be housed in St. Joseph's Hospital in Deadwood.

Dr. Nelius J. Nessa, Sioux Falls, was elected president of the Seventh District Medical Society of South Dakota on December 14, 1937. Dr. Paul R. Billingsley, Sioux Falls, was chosen vice president; and Dr. H. R. Hummer was re-elected secretary. Dr. William P. Sadler, of Minneapolis, instructor in obstetrics in the University of Minnesota Medical School, was the speaker.

Dr. James Nicholas Dunn, St. Paul, was installed as president of the Ramsey County Medical Society on January 1, 1938. Dr. Walter Douglas Brodie, St. Paul, is the vice president; and Dr. J. Allen Wilson, St. Paul, assistant in medicine in the University of Minnesota Medical School, is secretary-treasurer. Delegates to the state medical convention are: Dr. J. Richards Aurelius, instructor in radiology in the University of Minnesota; Dr. E. Mendelssohn Jones, associate professor of surgery; and Dr. O. William Holcomb, all of St. Paul.

Donald M. Hetler, A.B., A.M., Ph.D., associate professor of bacteriology and public health in the Montana State University, Missoula, spoke before the Pre-Medical Club of the University on "Migraine, Hay Fever and Hives" recently.

Dr. John William Campbell, Fargo, N. D., has leased space in the Merchants' Hotel at Grafton, where he will specialize in eye, ear, nose and throat work.

Dr. Frederick Karl Kolb, who has practiced at Graniteville, N. D., for more than 25 years, recently received a scrapbook containing photographs of children at whose birth he was the attending obstetrician.

Dr. B. A. Dyar, Pierre, assistant director of the South Dakota State Board of Health, was the speaker at the meeting of the Inter-Allied Council at Sioux Falls on March 16, 1938.

Dr. Ronald Gustav Scherer, Bozeman, Montana, spoke before the Bozeman Women's Club on March 8, 1938, on "Social Hygiene."

Dr. Osmer S. Randall, Watertown, addressed the Watertown Kiwanis Club of South Dakota on February 21, 1938, on the subject of "Cancer".

The University of Minnesota sponsored an institute in traumatic surgery as a postgraduate course at the university from March 7 to 12, 1938. Dr. Wallace H. Cole, St. Paul, professor and chief of the department of orthopedic surgery at the university, directed the program and curriculum.

Dr. Louis H. Fligman, Helena, of the Montana State Board of Health, attended a series of heart clinics in Philadelphia sponsored by the American College of Physicians at the University of Pennsylvania during March.

Dr. August C. Orr, of the children's division of the North Dakota State Department of Health, examined 146 children recently in the Bismarck area, the occasion being the 2nd pre-school conference.

Dr. Richard R. Cranmer, Minneapolis, instructor in surgery in the University of Minnesota Medical School, spoke on "New Developments in the Treatment of Appendicitis" before the Scott-Carver Medical Society on March 8, 1938, at Mudcura Sanatorium, Shakopee, Minn. Dr. Joseph C. Michael, associate professor of nervous and mental diseases in the University of Minnesota, spoke on "Common Mental Disorders."

Dr. Clarence C. Little, New York City, managing director of the American Society for the Control of Cancer, spoke at a public meeting on cancer held in the auditorium of the Music Building at the University of Minnesota on March 11, 1938. Dr. James H. Hayes, president of the Minnesota State Medical Association, was the presiding officer; and Dr. Martin Nordland, Minneapolis, secretary of the state association's committee on cancer, introduced Dr. Little.

Dr. Patrick O'Hair, Waverly, Minn., celebrated his 90th birthday at his home on February 24, 1938. Born in Ireland in 1848, Dr. O'Hair came to the United States in 1849, and after some years as a railway laborer, entered the University of Iowa College of Medicine, from which he was graduated in 1880. He came to Waverly in 1881, from Minneapolis.

Dr. Viola Russell, Pierre, director of the division of maternal and child health of the South Dakota State Board of Health, spoke on "Child Health Day" before the Custer County Health Committee at Custer on February 10, 1938.

Six Butte physicians compose the executive committee of the Women's Field Army of the American Society for the Control of Cancer in the area of Butte, Montana. They are: Dr. Samuel Saunders Steinberg, Dr. Peter T. Spurck, Dr. Patrick E. Kane, Dr. Herbert H. James, Dr. Donald E. Hale, and Dr. Raymond F. Peterson.

Dr. Francis Weldon Ford, Devils Lake, N. D., a graduate of the Tufts College Medical School in 1935, was appointed city health officer for Devils Lake following the death of his uncle, the late Dr. C. J. McGurran. Dr. Ford will also take over the practice of his uncle in the Bangs Block.

The Veterans of Foreign Wars in Montana have begun a campaign for the purchase of a Drinker respirator for hospitals in Great Falls.

Dr. Alfred J. Kreft, of Bridewell Hospital in Chicago, has joined the staff of the Smith Clinic in Glasgow, Montana, as surgeon.

Dr. Mark Frederic Williams, Hettinger, N. D., has moved to Linton, to be associated with Dr. Willis B. Shepard, of the Linton Hospital.

The customary radio broadcast of the Minnesota State Medical Association, with Dr. William A. O'Brien, associate professor of pathology and preventive medicine in the University of Minnesota, as speaker, is as follows for the month of April: Station WCCO (810 kilocycles, 370.2 meters), at 9:45 A. M. each Saturday. Subjects are: April 2, "Our 10th Anniversary"; April 9, "Arteriosclerosis"; April 16, "Glaucoma"; April 23, "Brain Tumors"; and April 30, "Dental Research."

Dr. John A. Cowan, state epidemiologist for North Dakota, has accepted the post of chairman of social hygiene for the North Dakota Congress of Parents and Teachers.

Necrology

One of Minnesota's pioneer physicians, Dr. Christen Quevli, Sr., 73, died in Seattle, Washington, on December 8, 1937. Dr. Quevli, born in Norway, was graduated from the old Minnesota Hospital College in Minneapolis in 1886, licensed in 1888, and began to practice in Lamberton. He later moved to Tacoma, Wash., and was president of the Washington State Tuberculosis Association from 1911 to 1921, and was famous throughout Washington for his phthisis work.

Donovan John Penheiter, B.S., M.B., M.D., 26, a graduate of the Northwestern University Medical School in 1936, died *en route* to a Duluth hospital on November 26, 1937. He was born at Moorhead, Minnesota, and had commenced practice at Bagley. His internship was served at St. Luke's Hospital in Duluth.

Dr. John T. Gill, 78, a graduate of the New York Homeopathic Medical College and Flower Hospital, New York City, in 1886, died at Echo on February 21, 1938. He had practiced at Echo since 1895.

Dr. Edward Josiah Brown, 87, a resident of Minneapolis for 56 years, died at his home on March 15, 1938. A graduate of the Dartmouth College School of Medicine in 1879, Dr. Brown was president of the Hennepin County Medical Society in 1888 and 1889, and president of the Minnesota Academy of Ophthalmology and Otolaryngology in 1914. He was also a former member of the Minneapolis and Minnesota boards of health.

Dr. Fritz Ernest Buchen, 72, of Darby, Montana, died at Hamilton on March 1, 1938. He was a former vice-president of the Medical Association of Montana; and was graduated from the Vanderbilt University School of Medicine at Nashville in 1899.

Dr. Raymond Wesley Lagerson, 40, for 15 years a physician in Minneapolis, died at University Hospital on March 13, 1938. A graduate of the University of Minnesota Medical School in 1923, Dr. Lagerson was a staff member of Saint Barnabas Hospital in Minneapolis.

Dr. Charles Joseph McGurran, 64, pioneer Devils Lake, N. D., physician, died at his home on March 11, 1938. He was a former state health officer, former grand knight of the Knights of Columbus, and was graduated from the old Minneapolis College of Physicians & Surgeons in 1904.

LIST OF PHYSICIANS LICENSED BY THE MINNESOTA STATE BOARD OF MEDICAL EXAMINERS
ON FEBRUARY 11, 1938

JANUARY EXAMINATION

Name	School	Address
Bagley, Charles Miller	Stanford U., M.D., 1937	905 Medical Arts Bldg., Duluth, Minn.
Bagwell, John Spurgeon, Jr.	Baylor U., M.D., 1936	Mayo Clinic, Rochester, Minn.
Bailey, Allan Archibald	U. of Toronto, M.D., 1935	Mayo Clinic, Rochester, Minn.
Baumgartner, Florian Herman	U. of Minn., M.B., 1937	73 N. Oxford St., St. Paul, Minn.
Caspers, Carl Gerald	U. of Minn., M.B., 1937	191 W. Winifred St., St. Paul, Minn.
Cochrane, Byran Barlow	U. of Minn., M.B., 1937	Miller Hospital, St. Paul, Minn.
Code, Charles Frederick	U. of Manitoba, M.D., 1934	Mayo Clinic, Rochester, Minn.
Davis, Luther Forest	U. of Minn., M.B., 1937	Wadena, Minn.
Doss, Alexander Keller	Tulane U., M.D., 1934	Mayo Clinic, Rochester, Minn.
Ferris, Deward Olmstead	Queen's U., M.D., 1931	Mayo Clinic, Rochester, Minn.
Fisher, Herbert Calvin	Cornell U., M.D., 1935	Mayo Clinic, Rochester, Minn.
Fitzsimons, William Edmund	U. of Minn., M.B., 1937	Ancker Hospital, St. Paul, Minn.
Giffin, Herbert Martin	Johns Hopkins, M.D., 1935	Mayo Clinic, Rochester, Minn.
Giffin, Lewis Albee	Harvard U., M.D., 1935	Mayo Clinic, Rochester, Minn.
Gilman, Lloyd C.	U. of Minn., M.B., 1937	Mpls. General Hospital, Minneapolis, Minn.
Glabbe, Robert Alfred	U. of Minn., M.B., 1937	St. Luke's Hospital, Duluth, Minn.
Hackie, Edward Anthony	U. of Manitoba, M.D., 1937	St. Barnabas Hospital, Minneapolis, Minn.
Hargis, William Huard, Jr.	U. of Texas, M.D., 1936	Mayo Clinic, Rochester, Minn.
Harris, Leon Dunham	U. of Minn., M.B., 1937	3620 Colfax Ave. S., Minneapolis, Minn.
Howard, E. Graham	U. of Minn., M.B. & M.D., 1935	Mapleton, Minn.
Jenovese, Joseph Francis	U. of Pa., M.D., 1930	Mayo Clinic, Rochester, Minn.
Jones, Orville Hugh	U. of Minn., M.B., 1937	St. Mary's Hospital, Minneapolis, Minn.
Kindschi, Leslie George	Harvard, M.D., 1935	Mayo Clinic, Rochester, Minn.
Lauer, Dolor John	U. of Minn., M.B., 1937	St. Mary's Hospital, Duluth, Minn.
Lovering, Joseph	U. of Pa., M.D., 1934	Mayo Clinic, Rochester, Minn.
Marshall, Mary Emily	U. of Toronto, M.D., 1935	Mayo Clinic, Rochester, Minn.
Martin, Dwight Lewis	U. of Minn., M.B., 1937	Ancker Hospital, St. Paul, Minn.
Meller, Charlotte Louise	U. of Minn., M.B., 1937	St. Joseph's Hospital, St. Paul, Minn.
Meller, Robert Louis	U. of Minn., M.B., 1937	St. Joseph's Hospital, St. Paul, Minn.
Pansch, Frank Norman	Northwestern, M.B., 1936, M.D., 1937	Mayo Clinic, Rochester, Minn.
Quill, Thomas H.	Georgetown U., M.D., 1933	Mayo Clinic, Rochester, Minn.
Randall, Karl Chandler, II	U. of Pittsburgh, M.D., 1935	Mayo Clinic, Rochester, Minn.
Roxburgh, Douglas Brant	U. of Alberta, M.D., 1932	Mayo Clinic, Rochester, Minn.
Sako, Wallace Saburo	U. of Minn., M.B., 1935, M.D., 1936	Mpls. General Hospital, Minneapolis, Minn.
Schamber, Walter Fred	Rush Med. Col., M.D., 1937	St. Mary's Hospital, Duluth, Minn.
Schlicke, Carl Paul	Johns Hopkins, M.D., 1935	Mayo Clinic, Rochester, Minn.
Schulte, Thomas Lacoste	Stanford U., M.D., 1936	Mayo Clinic, Rochester, Minn.
Schunke, Gustave Bernard	Stanford U., M.D., 1936	Mayo Clinic, Rochester, Minn.
Schwartz, Eleazer Robert	U. of Minn., M.B., 1936, M.D., 1937	1724—11th Ave. S., Minneapolis, Minn.
Sharpe, Wendell Smith	Johns Hopkins U., M.D., 1935	Mayo Clinic, Rochester, Minn.
Smith, James John	St. Louis U., M.D., 1937	Ancker Hospital, St. Paul, Minn.
Smith, Kendrick Adelbert	U. of Chicago, M.D., 1937	Mayo Clinic, Rochester, Minn.
Sommers, Ben	U. of Minn., M.B., 1937	Ancker Hospital, St. Paul, Minn.
Tesch, Gordon Harrison	U. of Minn., M.B., 1937	Ancker Hospital, St. Paul, Minn.
Tessmer, Carl Frederick	U. of Pittsburgh, M.D., 1935	Mayo Clinic, Rochester, Minn.
Textor, Jerome D.	U. of Minn., M.B., 1936, M.D., 1937	U. of Minn. Hospitals, Minneapolis, Minn.
Thigpen, Francis Marion	Tulane U., M.D., 1934	Mayo Clinic, Rochester, Minn.
Tooke, Thomas Bell, Jr.	Tulane U., M.D., 1936	Mayo Clinic, Rochester, Minn.
Usher, Francis Cowgill	U. of Pa., M.D., 1935	Mayo Clinic, Rochester, Minn.
Wadd, Clifford Theodore	U. of Minn., M.B., 1937	Mpls. General Hospital, Minneapolis, Minn.
Waggoner, Richard Perham	U. of Ore., M.D., 1935	Mayo Clinic, Rochester, Minn.
Wilcox, Leigh Edgar	U. of Louisville, M.D., 1933	Mayo Clinic, Rochester, Minn.
Willson, Donald Maclean	U. of Pa., M.D., 1935	Mayo Clinic, Rochester, Minn.
Wittels, Theodore Saul	U. of Minn., M.B., 1936	U. of Minn. Hospitals, Minneapolis, Minn.

BY RECIPROCITY

Baker, Ellis Ellsworth	U. of Neb., M.D., 1932	Gillette, Wyo.
Gillesby, William James	U. of Ill., M.D., 1932	Rood Hospital, Chisholm, Minn.
Puumala, Marie Bepko	U. of Ill., M.D., 1935	1011 Cloquet Ave., Cloquet, Minn.

NATIONAL BOARD CREDENTIALS

Buirge, Raymond E.	Duke U., M.D., 1934	217 Harvard St. S. E., Minneapolis, Minn.
Derbyshire, Robert Cushing	Johns Hopkins, M.D., 1936	Mayo Clinic, Rochester, Minn.
Limbert, Edwin Manning	U. of Toronto, M.D., 1934	Mayo Clinic, Rochester, Minn.
Mueller, Roland Frederick	Wash. U., M.D., 1929	Two Harbors, Minn.
Nesbitt, Samuel	Harvard U., M.D., 1935	Mayo Clinic, Rochester, Minn.

Minneapolis, Minnesota
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Vol. LVIII. No. 5
New Series

Brain Tumors in Children

Alfred W. Adson, M.D.†

Rochester, Minnesota

CHILDREN are as susceptible to cerebral neoplasms as are adults. The tumor may arise from any of the cerebral structures but have a tendency to occur in the posterior fossa below the tentorium cerebelli. In adults, 70 per cent of tumors are located above the tentorium and 30 per cent are located within the posterior fossa. In children the percentages are reversed.

The most common lesions in children are the medulloblastomas, spongioblastoma multiforme, astrocytomas, ependymomas of the cerebellum and pons, and the tumors of the hypophyseal duct of the pituitary body. Cholesteatomas, dermoids and pineal tumors occur next in order of frequency. Angiomas and ganglioneuromas occur less frequently. Meningeomas and acoustic neuromas occur rarely. Since tumors occurring in children are encapsulated less frequently than are those occurring in adults, and since more of the tumors which affect children are located in and about the fourth ventricle, the surgical successes are less in cases in which the patients are children than they are in cases in which the patients are adults. Fortunately, many of the ependymomas are removable and the astrocytomas are cystic which allows for drainage and resection of the mural nodules. Tumors of the hypophyseal duct and cholesteatomas are rather amenable to surgical treatment. The inoperable tumors are only temporarily relieved by decompression unless they are very vascular, when irradiation offers additional relief of symptoms and prolongation of life.

† Section on neurologic surgery, the Mayo Clinic, Rochester, Minnesota.

Cranial surgery¹ dates back to the ancient Egyptians, Romans, and Peruvians, who trepanned skulls to permit egress to the evil spirits within, but who also must have treated injuries of the skull if explanation is to be made of the extensive defects present in the skulls preserved in museums. Traumatic cranial surgery undoubtedly was practiced during the various epochs before modern antiseptic and aseptic surgery was introduced.^{16,17} Records show this was true during the Napoleonic wars. The depth of the surgical procedures was limited by the dura, as those who penetrated below the dura met with failures resulting from suppuration.

Richmond Godlee,⁸ of London, is accredited with having been the first to remove successfully a tumor of the brain. The tumor had been localized by Bennett, who employed the newer neurologic methods. Godlee was able to accomplish the removal by employing Lister's antiseptic technic. The date of this operation was November 25, 1884, and the results of the procedure were reported in 1885. Ballance, in his monograph, "A Glimpse into the History of Surgery of the Brain,"⁵ stated that Heyman, in 1831, had removed a tumor of the parietal bone from a patient, eight years of age, who had jacksonian convulsions. Other similar references are found in literature, but the reports differ from that of Godlee, in that localized cranial signs, such as presentation of the tumor through the bone, rather than the neurologic symptoms which were employed by Bennett, led to the localization of the growth.

The science of surgery of the brain has made rapid progress in recent years, with improvements in cerebral localization and surgical technic. At the birth of this

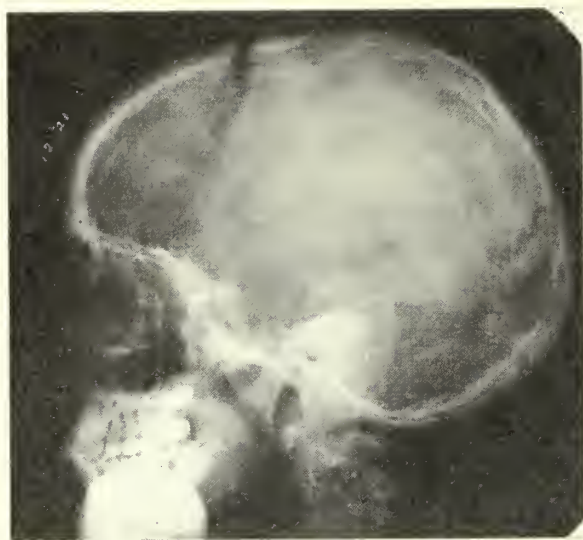


Fig. 1. Lateral roentgenogram showing evidence of increased intracranial pressure; digitations are present in the cranial vault, the sella turcica is enlarged, the clinoid processes are partially eroded and the sutures have separated.

surgical specialty fifty-odd years ago, the surgeons were more concerned about the details of craniotomy than they were about the treatment of the tumors exposed. The introduction of antisepsis, asepsis, and methods of hemostasis has reduced surgical hazards and has lowered surgical mortality. The added experience of neurologists and pathologists has done much to improve the diagnosis and localization of brain tumor. Therefore, the neurosurgeon of today is expected to evaluate clinical, neurologic and laboratory findings, and be able to execute the accepted modern surgical procedures in the treatment of patients who have brain tumors.

In arriving at a diagnosis of an organic intracranial lesion (Fig. 1), it is extremely important to proceed in an orderly fashion by a carefully taken history and by conducting physical, neurologic, ophthalmologic, roentgenographic and selected laboratory examinations. It is impracticable to rely on special tests, such as pneumo-ventriculography or pneumo-encephalography, to the exclusion of evidence elicited in the course of the routine examination.

A thorough history is invaluable when working out a differential diagnosis. General examination also assists in distinguishing between coexisting diseases; neurologic examination discloses mental states, normal or abnormal reflexes, and motor and sensory findings. Ophthalmologic examination reveals the condition of ocular movements, the presence or absence of pathologic conditions of the ocular fundi and visual fields, such as ocular palsy, papilledema, optic neuritis, optic atrophy, and defects in the perimetric fields. These data aid in confirmation of the neurologic manifestations. Roentgenographic examination, which includes plain and stereoscopic roentgenograms, demonstrates erosion, convolutional markings, hyperostosis, inflammatory lesions of the skull, and deposits of calcium in neoplasms and vascular lesions.

Pneumo-encephalography is of value in demonstrating convolutional destruction and cerebral atrophy in traumatic and circulatory disease, and ventricular deformities in circulatory, neoplastic and congenital lesions; but it may be a dangerous procedure if a cerebral neoplasm is present.

Pneumoventriculography has become widely used and is valuable in the localization of tumors early in their growth and when they are situated in silent areas. Occasionally, it is used preliminarily to operation, to estimate the size and depth of localized tumors.

The number of laboratory tests depends on the history of coexisting diseases and on the physical and neurologic findings. Spinal puncture and examination of spinal fluid are indicated if trauma, and circulatory and inflammatory lesions are present, but, only occasionally, if cerebral neoplasms are present. These procedures reveal the presence or absence of blood, intraspinal pressure, the presence or absence of organisms, and furnish valuable information concerning the protein content and other chemical changes in the fluid and the number and morphology of the cells. In cases in which syphilis and parasitic lesions are suspected, the serologic test of the spinal fluid offers material assistance in arriving at a diagnosis. Spinal puncture is contraindicated in the presence of increased intracranial pressure when papilledema is of more than 2 diopters.

Increased Intracranial Pressure

The early signs of increased intracranial pressure are manifested by headache, vomiting and choked disks. It is not necessary for all three to develop simultaneously, but sooner or later they will all be present. Tumors situated in the region of the optic chiasm, in the cortico-sensory and motor areas, and in the cerebellopontine angle are the exception, since symptoms of localization develop before symptoms of increased intracranial pressure. If the patient is ambulatory, the headache occurs daily in the early morning hours and frequently awakens the patient about 4:00 A. M. Vomiting is of the projectile type and is often associated with headache and with movements of the head. Pain in the occiput and rigidity of the neck are accompanying symptoms of infratentorial tumors. Papilledema or choked disks may be confused with the edema of retrobulbar neuritis, but when it is associated with headache and vomiting it invariably means the presence of increased intracranial pressure. However, tumors situated in the sella turcica or in the chiasmal region, which produce direct pressure on the optic nerves, will result in pallor of the optic disks instead of edema. When they grow to sufficient size to obstruct the free flow of cerebrospinal fluid in the ventricles and subarachnoid spaces, edema of the disk will appear; this will be followed later by secondary optic atrophy. Lesions that obstruct the third and fourth ventricles produce a high degree of choked disk which progresses rapidly. Pain and stiffness of the neck, which are associated with a cracked sound of the skull, accompany a high degree of increased intracranial pressure.



Fig. 2. Drawing of adhesive arachnoiditis which has obstructed the flow of cerebrospinal fluid from the fourth ventricle and produced an internal hydrocephalus.

Localizing Symptoms

The syndromes of tumor vary considerably according to position, rate of growth, size and pathologic features. Each group of tumors produces a chain of symptoms peculiar to its own life cycle. It is apparent that lesions of the frontal lobes will give rise to psychic and personality changes. Those arising in the speech, motor and sensory centers will produce aphasia, apraxia, jacksonian convulsions, convulsions of grand mal, monoplegia and hemiplegia. Other symptoms develop as respective centers, nuclei and tracts become invaded, destroyed or deprived of their normal blood supply by indirect pressure. Since the literature contains numerous articles and monographs on syndromes of tumor, I believe it is unnecessary to continue further here with the discussion of symptoms; but I do want to emphasize the importance of recognizing the symptoms of increased intracranial pressure.

In considering the differential diagnosis, it must be borne in mind that certain features in the symptoms resulting from cerebral trauma, inflammatory diseases, and suppurative diseases may resemble those of tumor. Therefore, it is important to obtain a thorough history in chronologic order to elicit differential diagnostic facts. The symptoms of cerebral arteriosclerosis are rarely confused with those resulting from tumor, since the evidence of increased intracranial pressure is lacking. The occasional occurrence of cerebral thrombosis of slow progression, subdural hemorrhage and intracerebral hemorrhage may readily produce symptoms which simulate those of tumor, and which require surgical intervention in order that proper surgical treatment may be administered in cases of frank hemorrhages and in order that an operable tumor may not be overlooked.

Intracerebellar Tumors

The symptoms of intracerebellar tumors are homolateral ataxia, dyssynergia, dysmetria, dysdiadochokinesia and atony of the muscles of the limbs on the involved side with diminution in reflexes. Nystagmus, vertigo and tilting of the head are present when the vestibular

nuclei are compressed. If the tumor is slow in growth, the localizing signs may antedate the symptoms of intracranial pressure.

Tumors of the Vermis

Tumors² involving the vermis may be situated either in the anterior or the posterior portion, and usually occur in children under the age of twelve years; and, most frequently, in those under the age of six years. The symptoms are abrupt in onset and are of short duration. Marked intracranial pressure occurs with headache, vomiting, severe choking of the optic disks, and stiff neck. The localizing symptoms consist of marked ataxia, equal on both sides, and usually affects the lower extremities and the trunk more than it does the upper extremities, so that there is a great tendency for the patient to pitch forward or backward. Frequently, the neck is rigid and the head retracted; palsy of the external recti and diplopia and paralysis of the conjugate lateral movements of the eyes are common manifestations. Other localizing signs are absent, as a rule, until the tumor produces pressure on the floor of the fourth ventricle with medullary herniation, when death may occur abruptly. Pathologically, tumors of the vermis are either gliomas or medulloblastomas.

Recognition of a lesion of the vermis is often difficult, inasmuch as the symptoms are not unlike those arising from hydrocephalus. While it is true that there is a congenital obstructive hydrocephalus, not infrequently obstructive hydrocephalus may develop as the result of ependymitis with occlusion of the aqueduct of Sylvius subsequent to a contagious disease, such as measles, whooping-cough or scarlet fever. Communicating hydrocephalus may arise from similar causes, but its course is more protracted; it is due to changes in the arachnoid and villi, and to the failure of the cerebrospinal fluid to be absorbed as rapidly as it should be. Circumscribed cystic arachnoiditis and occlusion of the fourth ventricle from adhesions between the cerebellar hemispheres and vermis and medulla, may arise from similar causes and produce symptoms similar to those of a tumor of the

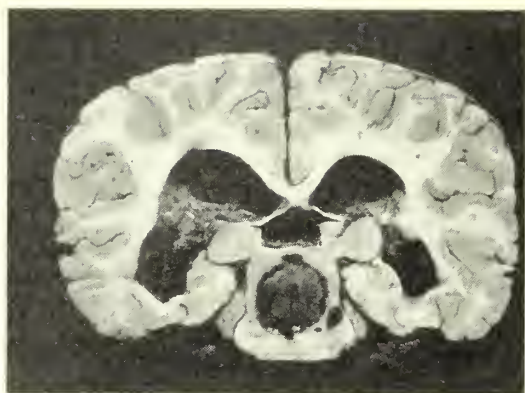


Fig. 3. A coronal section of brain illustrating internal hydrocephalus caused by blocking of the aqueduct of Sylvius and the fourth ventricle by an ependymoma.

vermis. In making a differential diagnosis, one must consider carefully the history of onset. In tumors of the vermis, the onset of symptoms is abrupt; in hydrocephalus, unless it is congenital, the onset of symptoms is less abrupt and is preceded by a contagious disease or perhaps some other acute infection. Ventriculographic examination may be advisable before exploration, to determine the site of the block which may be in the aqueduct of Sylvius, in the fourth ventricle or its foramina, or in the posterior cistern. Occasionally, puncture of the cistern may be employed to demonstrate communicating hydrocephalus, but at all times such procedures should be performed in the operating room where the surgeon is prepared to go on to cerebellar exploration, should signs of respiratory embarrassment develop.

Another differentiating factor which should be given consideration is the degree of choked disk, which in tumors of the vermis quickly becomes extreme (from 3 to 7 diopters). In hydrocephalus (Fig. 2) the choked disk progresses slowly and rarely attains an elevation of more than 3 diopters in the obstructive type of choked disk and rarely more than 1 or 2 diopters in the communicating type. These data are not absolute, but serve as a rather reliable guide.

Tumors of the Cerebellar Peduncles

Tumors originating in cerebellar peduncles usually involve the cerebellar nuclei and cortex sooner or later, either by direct invasion or by the effects of pressure. The symptoms are similar in onset, progress and development to those of tumor of the cerebellum proper. Symptoms resulting from the influence of the tumor on neighboring structures are usually more marked than are those of lesions of the hemispheres and vermis.

The surgical approach is similar to that employed for cerebellar tumors, except that tumors of the cerebellar peduncles are less accessible and the surgeon must frequently resort to bilateral cerebellar decompression instead of attempting any type of removal. Postoperative treatment is carried out as in lesions of the cerebellum proper.

Granulomas

Tuberculoma of the cerebellar hemispheres and vermis occurs occasionally but is rarely recognized as such,

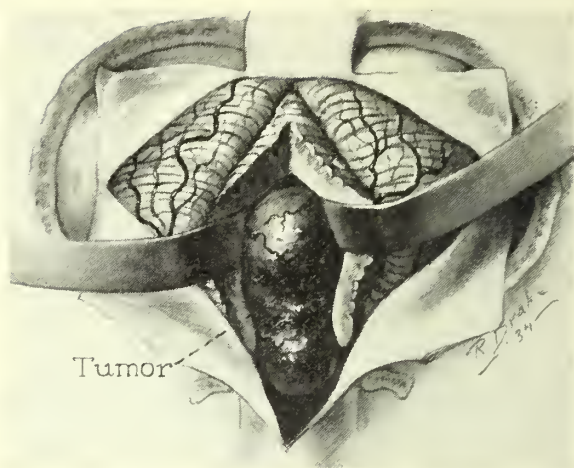


Fig. 4. Drawing of operable ependymoma of the fourth ventricle.

unless an increase in lymphocytes and bacilli of tuberculosis are found in the spinal fluid. As a rule, tuberculomas are nodular; they are readily recognized by their firmness and by the presence of small, bead-like nodules on the surface or along a vessel supplying the mass. If the identity of a tuberculoma is determined, surgical treatment is contra-indicated, since the duration of life is limited. If a tuberculoma is found accidentally, and has been diagnosed as a cerebellar tumor, the surgeon has the option of allowing it to remain undisturbed or removing it.

Tumors of the Fourth Ventricle

Tumors arising from the floor of the fourth ventricle are usually ependymomas (Figs. 3 and 4) or subependymal gliomas; those arising from the choroid plexus are frequently papillomas; those arising from the roof of the fourth ventricle (vermis) are gliomas and spongioblastomas. The clinical syndrome is similar to that of tumors of the vermis; it consists of sudden, acute, marked internal hydrocephalus, truncal ataxia, diplopia, rigidity of the neck, and retraction of the head. Vomiting is an early and incessant symptom, and may occur prior to the appearance of headache. Hiccup occurs frequently and is a pronounced symptom. The periodicity of symptoms in pedunculated tumors is a characteristic phenomenon; this consists of the sudden onset of severe headache, vomiting, papilledema, slow pulse, and coma, with just as sudden recovery. Postural influence is of diagnostic value; sudden increase in symptoms occurs on change of posture and death may occur suddenly and unexpectedly.

Pontine and Medullary Tumors

Pontine and medullary tumors are of the infiltrating type and are gliomas, medulloblastomas, spongioblastomas or, occasionally, tuberculomas. The characteristic clinical syndrome is homolateral involvement of the fifth, sixth, and seventh cranial nerves with heterolateral hemiplegia; the signs of intracranial pressure are late in appearance, and ataxia and nystagmus are associated symptoms. Since pontine tumors often affect both sides



Fig. 5. Lateral roentgenogram illustrating the presence of a tumor of the hypophyseal duct; a calcareous shadow outlines a tumor mass, which extends from an eroded sella turcica into the anterior fossa; there also is evidence of increased intracranial pressure.

of the pons, the symptoms are usually bilateral. Weakness of the lateral conjugate movements of the eye is common, owing to bilateral involvement of the posterior longitudinal bundle.

Tumors of the medulla produce similar symptoms but there is less likely to be involvement of the fifth, sixth, and seventh cranial nerves and bilateral involvement of the ninth, tenth, eleventh, and twelfth cranial nerves. Signs of intracranial pressure are late in appearance, and hemiplegia and quadriplegia develop alternately, according to the relative position and size of the tumor. Cerebellar symptoms occur according to the degree of involvement of the adjacent cerebellar lobes and tracts.

Tumors of the Hypophyseal Duct

"In ³⁵ cases of tumor of the hypophyseal duct, as in any group of lesions presenting such a wide and bizarre range of gross characteristics, the symptoms do not follow any stereotyped pattern, but depend on the size and rate of growth of the lesion, as well as on the order in which the adjacent structures are involved (Fig. 5).

"Importance has been placed on the exact site of origin of the tumor in relation to the dural roof of the sella turcica, as a determining factor in the sequence of development of clinical symptoms.³⁸ Those lesions which develop from epithelial cell rests, are situated below the diaphragma sellae; they naturally compress first the pituitary body and later extend upward to involve the cephalad structures. As this type of lesion expands upward it must push the dural roof before it, hence signs of pituitary dysfunction may long antedate other symptoms. Such lesions as a result of their anatomic situation may be considered epidural growths, and it has been suggested³⁸ that many instances of long standing mild headache in such cases may be the result

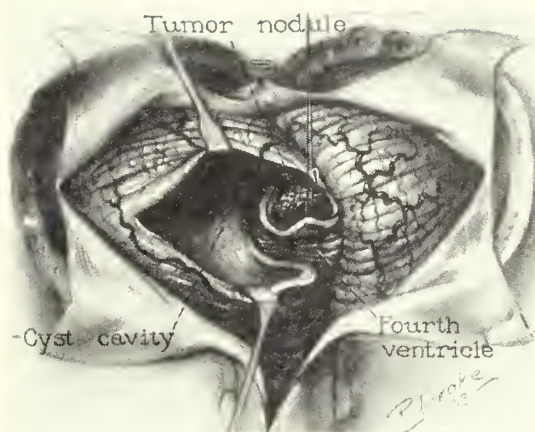


Fig. 6. Drawing illustrating the evacuated gliomatous cyst (astrocytoma) and a partial removal of a mural nodule from the left cerebellar lobe.

of gradual upward stretching of this portion of the dura rather than the result of low grade hydrocephalus.

"Lesions arising above the dural roof of the sella turcica have their origin in cell rests situated along the stalk of the infundibulum and anterior superior aspect of the capsule of the pituitary body. Naturally, such growths are within the subarachnoid space, and they early tend to fill the cisterna basalis. Tumors of this group tend to produce early involvement of the visual pathways and hypothalamus, whereas the element of pituitary dysfunction is not marked because the lesion is separated from the pituitary body by the diaphragma sellae.

"Naturally, if the tumor originates from rests situated at the point of passage of the stalk through the dural roof, if it grows rapidly, the function of structures both above and below the diaphragma sellae might be altered simultaneously.

"The symptoms may be further altered from any given pattern by a sudden hemorrhage into a large cystic cavity, or by a very rapid local degenerative process, which produces irritative material that may initiate a local or diffuse inflammatory process in the suprasellar region.³⁸

"The symptoms of a tumor of the hypophyseal duct have been described very well by Cushing.¹² They may be the result of pituitary dysfunction, visual disturbance, hypothalamic compression, or increased intracranial pressure associated with hydrocephalus. Generally, the initial symptoms are either visual or pituitary in nature, but if the lesion is allowed to progress to sufficient size, the majority of the classic symptoms will be present.

"Pituitary involvement results in degrees of dysfunction that vary from mild, easily overlooked hypopituitary states to obvious dystrophia adiposogenitalis. The endocrine disturbances are generally evidenced by the Fröhlich type of physical appearance; however, the Lorain type of infantilism without adiposity occasionally is observed. Critchley and Ironside mentioned the frequency of the association of acromegaly with intrasellar growths of this type¹¹ but this is contrary to our experience. Neither acromegaly nor gigantism was observed in any of the cases in this series.

"Cachexia is one of the less frequent manifestations of pituitary dysfunction; it has been observed by some

authors in cases of tumor of the hypophyseal duct but it did not occur in any of our cases.^{22,7} In one case mild menstrual irregularity, which first had been noticed eight years before the patient came to the clinic (case 8) had been the first symptom; the subsequent amenorrhea had antedated the onset of headache and vomiting by more than two years. In case 3, the patient, who was a man, aged thirty-one years, had noted an unusual feminine distribution of pubic hair, and a very pale and pasty complexion for many years. He remarked that it never had been necessary for him to shave oftener than every other day, or even at longer intervals. In cases 2 and 5 there was a frank appearance of dystrophia adiposogenitalis. In seven of the eleven cases there was evidence of pituitary dysfunction of some noticeable degree. A constant observation was the low value for the systolic blood pressure; the highest value was 110 mm. of mercury, and in six of the eleven cases the value for the systolic blood pressure was 90 mm. of mercury or less.

"Visual disturbances in our experience constituted the most common initial symptom; they were present in some form in every case. Progressive dimness of vision was the most common mode of onset and, in most instances (in eight of eleven cases) this was the result of gradually developing primary optic atrophy. It is noteworthy that in six of these eight cases the defect in the visual field was of a bitemporal variety. Homonymous hemianopia occurred in four cases; in two of these cases there was an associated mild papilledema, and in one case there was a well advanced degree of primary optic atrophy. A high degree of choked disk (4 diopters) was noted in only one case. In this case, the patient was a girl aged five years. Because of the age of the child, the visual fields could not be outlined. In one case (case 2) there was a history of definite visual hallucinations which had been associated with uncinat attacks. Four of our eleven patients had had periods of diplopia as a result of weakness of a cranial nerve. On theoretical grounds one would expect that the visual findings would indicate the situation of the lesion with reference to the optic chiasm, as well as shed some light on the probable *anlage* of the tumor. Many authors have discussed at length the reason for the great variation in the results of the visual examination, including ophthalmoscopy and examination of the visual field. It has been postulated that tumors arising from the superior cell rests produce choked disks and secondary optic atrophy, whereas those arising from the inferior cell rests cause early primary optic atrophy. Without doubt this is true in many instances. However, the surgical findings are generally such that accurate investigation of the probable origin of the tumor is not possible. No doubt, many of the variations in the visual findings can be further traced to the marked normal anatomic variations which occur in the position of the optic chiasm, such as variations in the outline of the sella turcica, the pituitary body and infundibulum. The frequency with which primary optic atrophy was associated with a bitemporal type of defect in the visual field is interesting and perhaps significant; it no doubt represents a prechiasmal situation of the lesion.

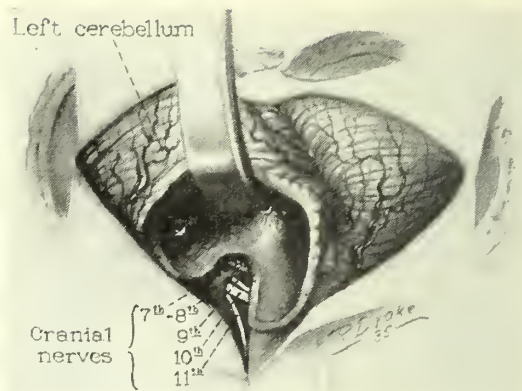


Fig. 7. Drawing illustrating the evacuated glomatous cyst (astrocytoma) and removal of the mural tumor nodule from the inferior surface of the left cerebellar lobe.

"Many authors have reported that hypothalamic symptoms occupy a conspicuous place in the symptomatology of these tumors. However, in our series they were neither a prominent nor important feature. Polydipsia and polyuria were not observed once in the entire group of cases. Drowsiness, although evident in five cases, always appeared as a very late development and more than likely was secondary to the hydrocephalus rather than the result of the primary involvement of the midbrain by the tumor.

"Hydrocephalus was a prominent feature, although the symptoms of increased intracranial pressure, for example, headache and vomiting, generally appeared late in the course of the illness. Choked disk was definite in all three cases in which there was no primary optic atrophy, and in all probability choked disk would have been present in all cases had not the atrophy preceded the development of the increased intracranial pressure. It is doubtful whether papilledema ever develops subsequent to the appearance of marked primary optic atrophy. Headache was an outstanding symptom in ten of the eleven cases, at some stage in the clinical history, and vomiting was present in five cases."

Surgical Technic

The anesthetic of choice is ether. Anesthesia is induced by the drop method; a Magill intratracheal tube is introduced as soon as the patient is anesthetized. The surgical field is shaved, the scalp is washed with soap and water, cleansed with ether and alcohol and an alcoholic solution of merthiolate is applied as an antiseptic. Supratentorial tumors are exposed through osteoplastic flaps; cerebellar tumors, tumors of the vermis and fourth ventricle as well as acoustic neurinomas and tumors of the cerebellopontine angle are exposed by a suboccipital craniotomy. The bleeding of the scalp is controlled by Adson's hemostatic skin clip. Bone flaps are opened with the Gigli saw after perforations in the skull have been made with the Hudson bur. In all suboccipital craniotomies the musculocutaneous flaps are reflected but the bone is removed by rongeur. Bone wax is employed to control bleeding along the cut bony edges. The electrosurgical diathermy current is used to control

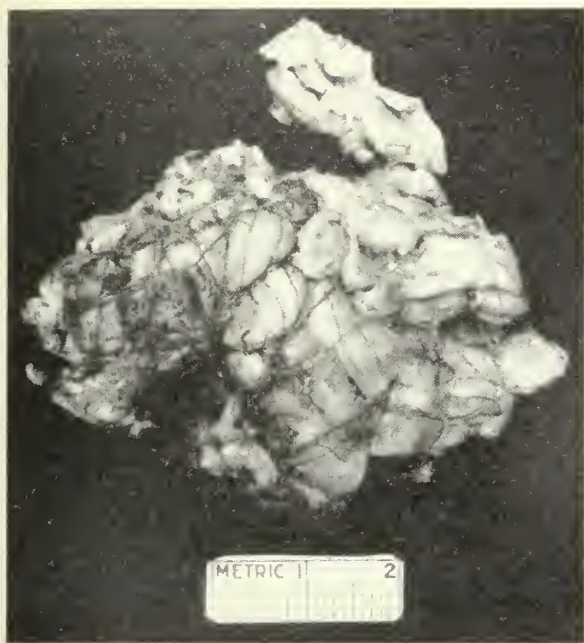


Fig. 8. Photograph of specimen illustrated in figure 7.

small bleeding vessels in the soft tissues; silver clips and silk ligatures are usually resorted to for hemostasis of vessels of the brain. The closure is made with interrupted silk sutures.

Removal of tumors ^{3,10,14,31} — Surgically, brain tumors are placed in two large groups; the one includes the encapsulated and accessible infiltrating tumors, and the other includes the diffuse, infiltrating and inaccessible tumors. It is apparent that the encapsulated accessible tumor lends itself better to surgical removal; however, the infiltrating tumor, when situated in a silent area, also can be removed by including the brain about the tumor. More often than not, in the group of non-encapsulated tumors, the surgeon is compelled to perform subtotal resection, removing necrotic, cystic material with mural nodules and tumor masses from within the tumor in order to avoid increasing the existing paralysis. Radical resections of diffuse infiltrating tumors are avoided if their removal may result in hemiplegia. I prefer to secure a shorter period of relief, with preservation of more normal function, than an extended, indefinite period of relief, with spastic hemiplegia. Decompression should never be substituted for removal of tumor when it is at all possible to perform radical operation, but decompression does serve as an auxiliary measure in subtotal resection of tumors and serves as a measure of temporary relief in the management of many inoperable tumors.

Glioma ^{4,31,32} — Pathologically, gliomas are classified according to their histologic structure and degree of malignancy. Surgically, they are grouped according to their accessibility and degree of malignancy. Those that are situated wholly within the silent areas are removed with the surrounding brain. Those that are situated in areas such as the frontal, temporal and occipital lobes,

postcentral areas, or in the cerebellar lobes can be resected with the surrounding brain without seriously incapacitating the patient. Those that are situated in the motor cortex require more conservative treatment, such as subtotal resection from within the tumor, to avoid increasing the existing motor disturbances. Resections of cerebral hemispheres have been performed, but these procedures should be limited to a small group, since a tumor that requires such extensive resection usually has invaded the basal ganglions and, unless they also are resected, removal is incomplete. Furthermore, I doubt if many patients would appreciate the extended period of life if they knew that they would suffer from spastic, partial or complete hemiplegia for their remaining years. Deeply placed subcortical tumors involving basal nuclei are situated beyond the reach of the surgeon.³⁷

Lobectomy and block resection of tumors are performed by dissection with the sharp knife or by the electrosurgical knife. Bleeding is prevented by electrocoagulation of the vessels. All large vessels are more securely controlled when ligated with silk ligatures. The electrosurgical knife produces more destruction than the scalpel; therefore, it should only be used when the scalpel fails to serve its purpose.

Oligodendroglioma and astrocytoma—These tumors represent the most benign types of gliomas. They grow slowly and often degenerate in the center. The astrocytoma may degenerate to such an extent that nothing remains but a mural nodule (Figs. 6, 7, 8 and 9). Following evacuation of the cystic content, which consists of yellow, syrupy fluid that coagulates on exposure to air, the mural nodule often can be removed completely and cure thus be effected. These tumors occur in all parts²¹ of the brain and at all ages, although they do occur in the cerebellar lobes¹³ and vermis more frequently before the age of fifteen years than they do after that age.^{19,20}

*Spongioblastoma multiforme*¹⁸—These tumors represent the average malignant type of glioma. They grow rapidly, are very vascular, have less tendency to degenerate than astrocytomas, and become cystic. Their total removal depends on their being situated in a region in which the surrounding tissue can be resected with the tumor.

Medulloblastoma — Medulloblastomas represent the most malignant group of all gliomas. They cannot be enucleated, and the only hope of removing them depends on their being situated in a silent area of the brain. Partial resection occasionally is advisable when the tumor obstructs the fourth ventricle.

Pituitary tumors^{23,24,28,38}—Pathologically, these tumors also are classified into numerous groups, but surgically they fall into two groups; those that are accessible and removable, and those that are nonaccessible or are malignant. Pituitary tumors and tumors of the hypophyseal duct invariably erode¹⁹ the sella turcica and clinoid processes, but sooner or later they grow beyond the sella. The adenomas usually extend upward and backward between the optic nerves and under the optic



Fig. 9. Photograph of patient taken six weeks after removal of tumor illustrated in figure 8.

chiasm, and produce typical bitemporal hemianopia and optic atrophy. As the growth continues or becomes cystic, it extends laterally under the optic nerves and vessels, or it may grow upward, and then grow over the optic chiasm under the temporal lobes or into the third ventricle by displacing the floor upward and blocking the foramina of Monro, thus giving rise to internal hydrocephalus, choked disks, loss of nasal portions of the visual fields, and complete amaurosis.

The transnasal approach has practically been abandoned for the transfrontal, extradural approach, since the latter approach is through a sterile field and offers greater opportunity to remove suprachiasmal tumors thoroughly as well as to enucleate intrasellar growths.²⁷

Surgical attack on pituitary tumors has been limited to neoplasms that produce visual disturbances. Unless

the symptoms have progressed to this degree, owing to lateral displacement of optic nerves and posterior displacement of the optic chiasm, the optic chiasm is situated so closely to the anterior crest of the sella turcica that it is impossible to open the sella without injuring the optic nerves. Attempts have been made to resect the pituitary body in cases of acromegaly in which patients have had no visual disturbances, but this has been unsatisfactory for the same reason. Radium seeds have been successfully planted in the pituitary body through the limited opening between the optic nerves.

The accepted approach is through a right transfrontal craniotomy. The frontal lobe is elevated,³⁰ and the dura is separated from the bone in the anterior fossa. The dissection is continued posteriorly to the wing of the sphenoid bone and mesially to the median line. The dura is then incised on the anterior crest of the sella, and the incision is extended laterally for 2 cm. along the wing of the sphenoid bone, and anteriorly, parallel with the falx cerebri for 3 cm. in order to expose the chiasmal structures adequately. The frontal lobe is protected with cotton strips before it is gently elevated with an illuminated spatula-like retractor. The greatest of precaution is employed in exposing the tumor. Cotton pledgets and packs are used to protect the optic nerves and chiasm. Vessels on the capsule are coagulated before the capsule is incised. The intracapsular content is removed by the use of curets, pituitary forceps; blunt dissection is performed with a cotton ball held with a bayonet forceps, and an aspirator is used to remove the content. Following the removal of the tumor, the capsule is gently dissected free from the optic nerves and vessels and retracted into the prechiasmal space, where it is resected, thus leaving only that portion which is adherent in the floor of the sella turcica. Intracapsular bleeding is controlled by cotton tampons, by the application of silver clips or by coagulation of bleeding points under direct vision. Pledgets of muscle may be used to control venous oozing. The craniotomy opening is closed as previously described.

*Pineal tumors,*²⁵ *cholesteatomas*²⁹ and *dermoids*²⁶ — These and other unusual tumors are explored and resected according to their position and structure. If encapsulated, they are treated as meningiomas. If non-encapsulated, they are treated in a manner similar to gliomas.

Tumors of the ventricles ^{6,9,15,33,36} — Ventricular tumors arise from the choroid plexus and ependyma, but may arise from the adjoining cerebral structures and bulge into the ventricular system. Tumors originating in the choroid plexus and ependyma often are pedunculated and may be removed completely, whereas those developing from the brain and extending into the ventricle are sessile, gliomatous, and rarely are operable.

Tumors of the lateral ventricle are not easily recognized clinically. The routine roentgenogram will visualize calcareous lesions of the choroid plexus, but it usually requires a ventriculogram to determine the situation and size of the tumor. These tumors are exposed through a frontal cortical incision which passes through

the midfrontal convolution into the ventricle. The posterior horn of the lateral ventricle is explored through a cortical incision made posterior to the sensory convolution.

Pedunculated tumors are resected with the aid of the electrosurgical knife and the coagulation current. One has no hesitancy in resecting portions of the choroid plexus. Tumors that extend into the ventricle from surrounding brain tissue lend themselves poorly to surgical treatment. A portion of the tumor may be removed, but not enough is accomplished to justify the procedure.

Tumors of the third ventricle are very similar in type to those which develop in the lateral ventricles, except that they produce rapid progression of internal hydrocephalus, inasmuch as they block the normal flow of cerebrospinal fluid. They are less accessible than tumors of the lateral ventricle. The best approach is through a dilated lateral ventricle. The right side is preferable to the left because the psychic and speech centers are situated in the left frontal lobe and in Broca's area, respectively. The third ventricle is then entered after dividing the septum pellucidum. Again, pedunculated tumors and cysts are the only tumors that are removable.

Tumors of the fourth ventricle, like other ventricular tumors, arise from the choroid plexus, ependyma, and surrounding tissues such as the nuclei, peduncles, and vermis. Pedunculated and circumscribed tumors are resectable, as are some tumors of the vermis, but removal of any tumor of the fourth ventricle is a hazardous procedure and requires the most delicate manipulation. Tumors that bulge into the fourth ventricle from the cerebellar lobe may be removed when the cerebellar tissue can be included with the tumor. Tumors that grow from the floor of the ventricle are difficult to manage, and the most that can be accomplished surgically is decompression that includes bilateral suboccipital decompression with longitudinal incision of the vermis. The decompression should include removal of bone from the posterior margin of the foramen magnum and from the dorsal fifth of the atlas, to relieve pressure about the medulla from the prolapsed cerebellar lobes. Occasionally, subtotal resection of the tumor is performed to relieve the obstruction at the lower end of the aqueduct as it enters the fourth ventricle.

Inoperable Tumors

Inoperable tumors that develop in, or involve, the corpus callosum, basal nuclei, brain stem, pons and medulla, present difficult surgical problems, since their removal is impossible and little if any relief is accomplished by decompression. Since many of these tumors are of the variety known as medulloblastoma and spongioblastoma multiforme, radiotherapy offers temporary relief. High-voltage roentgen rays constitute the most suitable type of therapy for adults who will cooperate, since it can be administered in massive doses over a short period. Radium is most suitable in the treatment of similar lesions among children and noncooperative patients, since the blocks of radium can be bandaged on the heads of the patients. It should always be remembered that the application of radiotherapy may increase

the symptoms for the first ten days owing to swelling and edema of tumor cells. This may require dehydration, a treatment which consists of limitation of fluids, diuretics, saline cathartics and enemas, and intravenous administration of hypertonic solutions of dextrose and sodium chloride.

All suboccipital craniotomies are in reality suboccipital decompressions since the bone rarely is elevated as a flap, but is removed with a rongeur and is never replaced during the closure. The muscles, fascia and scalp are closed in anatomic layers. The dura may also be resutured but, more often than not, it is allowed to lie loosely over the cerebellar lobes. To make the suboccipital decompression most effective, the occipital bone should be removed widely to include the bone above the foramen magnum and the dorsal arch of the atlas. I wish to emphasize again that decompression should not take the place of radical removal of tumors; but I do believe it serves as an adjunct in the treatment of tumors which cannot be removed entirely, and that it offers sufficient temporary relief in selected cases of inoperable tumors to warrant its use.

Summary

I hope that this discussion has partially convinced the skeptical reader that the condition of all patients with tumors of the brain is not hopeless, although a large number have inoperable tumors. The results inevitably will improve, and the mortality rate, decrease, as more about the life cycle and behavior of the various groups of tumors is learned. The earlier they are recognized, the less will be the cerebral destruction before treatment is instituted.

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Cryptorchidism*

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TO UNDERSTAND the problem presented by the boy with one or both testes undescended, it is necessary to have in mind the origin and functions of the testes; to know the usual abnormalities relating to descent of these organs with their effects upon function; and finally, to understand and evaluate the need for, and the application of, therapeutic and curative measures now available.

The testes originate at about the fourth fetal week, from the undifferentiated genital ridge of the mesonephros or Wolffian body. Toward the end of the second fetal month, the testes as such extend along the posterior wall of the parietal peritoneum. In the third month, involution of the cranial parts of the fetal testes results in a relative displacement of the testes downward, so that they lie in the iliac fossae. Further changes cause the testes to reach the level of the future internal inguinal ring during the fourth to seventh fetal months. During the eighth month, or by the ninth, they usually pass into the scrotum. The migration of the testes is accomplished by growth and differentiation of the primary sex organ; by involution of the cephalic parts of the genital ridge; by traction on the testes by the gubernaculum; by relative overgrowth of the thorax, trunk and extremities, in relation to growth of the sex organs; and by reason of other factors probably endocrine, the exact nature of which is, as yet, imperfectly understood.

Of special importance in testes migration is the rôle of the gubernaculum. This is described as a mass of

fibro-muscular tissue that forms under the inguinal fold of peritoneum below the testis as it lies in the iliac fossa. This ligament is said to grow down obliquely through the abdominal wall from a point lateral to the inferior epigastric artery. As it grows, it tunnels through the inguinal canal into the scrotum, making a passage for the after-coming saccus vaginalis with the attached testis. Three layers of investing fascia derived from the abdominal layers through which it passes are carried along with the gubernaculum. The upper attachment of the gubernaculum is the saccus vaginalis and testis. The lower attachments of the gubernaculum are four in number. The first terminates in the lower scrotum. It is along this path that the testis normally migrates and reaches the base of the scrotum. The second caudal attachment terminates over the pubic bone, the third in tissue in the femoral area over Scarpa's triangle, while the fourth ends in the perineum. Aberrant descent may occur along any of these latter three paths, resulting in ectopic cryptorchidism.

When the testis once reaches its definitive location, the fibers of the gubernaculum degenerate so that no trace of this ligament is found in the adult.

Before the testes can reach their normal position in the scrotum, there must be an invasion of the inguinal canal and the solid scrotum by a pocket of peritoneum, the saccus vaginalis. This invasion follows along the course of the gubernaculum. At first, the invading pocket of peritoneum opens into the abdominal cavity. Usually, during the first six months after birth, this peritoneal communication closes, and the saccus vaginalis becomes the tunica vaginalis. Persistence of this com-

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munication predisposes to hernia, a common complication of cryptorchidism.

With successful migration of the testis into the scrotum, the organ is in a position to carry out its normal function. Little evidence of this function is noticeable in infancy, although sex differences in skeletal build, facial appearance, speech development and play interests, become increasingly noticeable.

These early sex differences are thought to be due to the activity of the hormones of the interstitial cells. Before the onset of puberty, as early as eight or nine years of age, the hormonal activity of the interstitial cells increases. With the onset of puberty, at about thirteen years in the male, this activity results in the development of the secondary sex characteristics of the adult. The end of puberty is marked by the onset of function of the germ cells of the seminiferous tubules of the testes, with production of spermatozoa and development of fertility. In close association with these well-known functions are less well understood effects of testicular hormones upon other endocrine glands. One example of this is the increased storage of fat in the eunuch, another the hypogonadotropic or Fröhlich type of obesity, due possibly to altered pancreatic function or to change in the fat metabolism-regulating hormone of the anterior pituitary gland.

The effects of cryptorchidism upon the normal function of the testes and upon the individual as a whole, vary with the kind and degree of abnormality present.

If one testis is in normal position in the scrotum, or if one testis is not completely descended but is migratory and can be brought into the scrotum by gentle pressure, normal function of the interstitial cell and germ cell hormones occurs in the normal testis, with no demonstrable change in the individual other than the possible psychological effect of his feeling that he is only half-a-man. Fertility is not impaired. The undescended testis, if intra-abdominal, as shown by the experiments of Moore¹ in 1923, and Wangenstein² in 1927, will undergo atrophy with consequent loss of spermatogenesis, but without loss of interstitial cell function.

If both testes are undescended, are intra-abdominal, and at least one is not brought down before the age of eight years, atrophy of both testes will have occurred with resultant failure of development of the seminiferous tubules, loss of function of the germ cells, and afertility. McCollum³ found that 90 per cent of 89 cryptorchid men not operated were sterile. Function of the interstitial cells is not impaired. Hormonal production persists, with the development at puberty of secondary sex characteristics, so that eunuchism does not occur.

On the basis of the anatomical development of the testis, its related structures and the mechanism of its migration and descent, we can postulate various reasons for the occurrence of cryptorchidism. These may be:

1. Failure of development of the genital ridge or Wolffian body or failure of complete differentiation and separation of the testes from the embryonic site of development. This would result in one type of intra-abdominal cryptorchidism, with possible failure of both

interstitial and seminiferous tubule hormone function.

2. Failure of the gubernaculum to provide a passage for the saccus vaginalis through the internal ring, through the inguinal canal and into the scrotum. This would cause intra-abdominal retention of the testes.

3. Overfunction of a wrong branch of the gubernaculum, resulting in deflection of normal migration and so resulting in ectopia of the testes over the pubis, in Scarpa's triangle, or in the perineum.

4. Spasm of the cremaster muscle, holding the testes back in the inguinal canal with a resultant pseudo-cryptorchidism. The so-called migrating testes or variable cryptorchidism.

5. Failure or inadequate development of the processus vaginalis resulting in inadequate passage and arrested migration of the testes anywhere along the normal path.

6. Failure of development and absence of the internal or external inguinal rings.

7. Inadequate development of the vas deferens, resulting in holding back the testes from complete descent.

8. Abnormal vascular, lymphatic, or neural development of the spermatic cord resulting in shortening of the spermatic vessels, leading to arrest or prevention of migration of the testes.

9. Post-traumatic, or inflammatory adhesions, holding back or obstructing descent of the testes.

10. Abnormal endocrine function, resulting in either a lack of development of the testes or over-development of the testes, producing an organ too large to pass through an otherwise normal migratory avenue. This might be due to pituitary, pineal or adrenal gland dysfunction.

Whatever the cause, the general incidence according to Campbell⁴ is probably from 1 to 3 per cent. Hamilton and Hubert⁵ in September, 1937, reported 16 cases referred to them with a diagnosis of cryptorchidism. With application of a hot water bag to the groin, scrotum and perineum, the patient lying supine, they were able to relax the cremasteric and related muscles and bring the testes down into the normal position in the scrotum in ten of the sixteen cases. Only six had true undescended testes.

Any consideration of treatment must be based first upon an accurate determination of the true status of the apparently undescended testis. Harris'⁶ report of descent of the testis within 3 hours after a single injection of 100 rat units of gonadotropic hormone raises considerable doubt as to the truly cryptorchid state of that testis before treatment. Only that testis or those testes which cannot be brought down into the scrotum by manual pressure following adequate local application of heat, constitute true cryptorchidism. Treatment is indicated if there is true undescend; if there is a complicating hernia or torsion of the cord on the side of the undescended testis, or if the position of the undescended testis is favorable to trauma. Four methods of treatment are available:

1. Watchful waiting.
2. Hormone therapy.
3. Surgery.
4. Combined hormone therapy and surgery.

Watchful waiting has no place in the management of proved cryptorchid cases.

Hormone treatment deserves judicious consideration. Smith and Engle⁷ in 1927 reported that the use of pituitary transplants produced increase in the size of immature testes in monkeys. In September, 1930, Schapiro⁸ in Germany reported satisfactory treatment of cryptorchidism in man, using anterior pituitary-like hormone, obtained from the urine of pregnant women.

Since Schapiro's report, a considerable amount of literature has accumulated relating to endocrine treatment. Much of this is conflicting and confusing; nevertheless, a few apparently consistent effects of gonadotropic hormone treatment have been obtained. The greatest number of, and most startling results, have been reported on cases such as Harris',⁶ where it seems obvious that a true state of undescend of the testes was not established before treatment was started. Very few cases have had initial attempts to relax the cremasteric spasm, and many reported cures are undoubtedly cases of migratory or periodic undescend which would have come down satisfactorily at or near puberty without treatment. Few reports have had any adequate control cases. Making allowance for this, one cannot disregard the repeated observations in numerous studies that adequate hormone treatment will in most cases:

a. Produce no permanent harmful reactions if treatment is not continued longer than four to six months.

b. Stimulate and promote the development of interstitial cells and interstitial cell hormone as evidenced by increase in size of the undescended testes, the scrotum and penis and the enhancement of secondary sex characteristics, without effect on spermatogenic cells.

c. Promote and in some cases produce descent of retained or undescended testes, provided no obstructive anatomic abnormality exists.

d. Exert its effects upon the testis much less rapidly when the testis has once reached the scrotum.

e. In very large doses, have no more effect than smaller doses.

f. Give the best results in the obese, hypogonadic type of children.

g. Not cause atrophy of the testes or any of the genital parts.

h. If or when surgical treatment is necessary, increase the ease of operation, and the chances of a permanently successful surgical result.

On the basis of these established effects, it is advisable to give a course of hormone treatment to all cases of proved cryptorchidism.

Bigler, Hardy and Scott⁹ have collected reports of 267 cases of undescended testes treated with gonadotropic hormone. In 167 of these, or 62.5 per cent; complete scrotal descent was obtained. To this series they have added 91 cases of their own, in whom 61 per cent were benefited and 45 per cent obtained complete descent by hormone treatment.

Beneficial results of endocrine treatment when secured, are obtained by using anterior pituitary-like sex hormone obtained from the urine of pregnant women. Thyroid and anterior pituitary extract have also been used, but are less satisfactory.

Treatment may be started at the first year of age, but because of the occasional undesirable stimulation of growth of the penis in boys under six years of age, it is probably better to start treatment after seven years.

Five-tenths of one cc. may be used as the initial dose without regard to age. This is given intramuscularly or subcutaneously. Repeated doses are given two to three times weekly or daily. Each successive dose is increased 0.5 cc. until 4 to 5 cc., representing 400 to 500 rat units, are given each time.

This amount may be continued until descent of the testis occurs or until a total of 4,000 to 5,000 R.U. have been given. Reactions, either local or general, may occur in some cases. No serious effects are reported. Slight swelling, induration and local soreness at the site of injection or abdominal pain with nausea and vomiting following a few hours after treatment, have been noted.⁹

If satisfactory results are not obtained with such a course of treatment; if the future fertility of the patient depends upon bringing down at least one testis into the scrotum; or if there is hernia, torsion, or danger of trauma on the side of the undescended testis; surgery should be considered. The incidence of surgical cure reported by Bevan,¹⁰ is 42.5 per cent. The possible risk of development of malignancy in undescended testes in comparison to the incidence of cancer generally is not great enough to warrant removal of undescended testes. If both testes are undescended, and if following endocrine therapy it is not possible at operation to bring at least one testis into the scrotum, the testes should be placed back inside the abdomen rather than excised. This will preserve the interstitial cell hormone function and prevent eunuchism.

In conclusion, it may be said that the endocrine treatment of cryptorchidism offers at least an equal chance of cure as surgery; that the judicious use of sex hormone in selected cases has not proved harmful where a cure was not obtained; that the ease of operation is increased and the chances of a successful surgical cure are better where hormone treatment has been tried before, and if indicated, after surgical repair.

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The Fundamentals of Nutrition*

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The Annual Food Bill

THE annual food bill of the people of the United States has been estimated to exceed \$12,000,000,000. This bill is paid with very little fundamental knowledge of what food really is. This is not surprising, when one considers that most of the development of scientific knowledge regarding food and nutrition has come about during the past thirty years, through the insatiable curiosity of an army of research workers, chiefly biochemists and psychologists.

Along with this increase in knowledge has developed an enormous public interest in food and nutrition. The discovery of the vitamins has no doubt played a large part in this increased interest. Whether it has been their novelty, their exploitation, good press-agentry or merely a part of the general growth of public interest in science, the fact remains that the discovery of the vitamins has done more to focus public attention on the importance of nutrition for normal well-being than could have been accomplished by the activities of teachers and doctors in the course of a good many years.

For centuries the most commonly accepted idea about food and nutrition was that food to be nourishing must contain a single vital nutrient which living creatures were able to extract from the food by some mysterious process. According to this conception, the one thing which would insure adequate nourishment was a full stomach at frequent intervals.

Role of Diet

Now we appreciate that the diet must supply numerous chemical substances, nearly every one of which plays a specific rôle in relation to one or more of the numerous chemical processes which together constitute life. Furthermore, we also appreciate that the common articles of diet may differ greatly in the relative amounts of the fundamental nutrient principles. So we see that it is literally possible to starve to death for lack of some essential nutrient, even with a full stomach.

Equally astounding is the discovery that the partaking of a superabundance of some of the essential nutrient principles may cause serious ill effects. The ancient advocates of the full stomach theory knew what distress could temporarily follow a super-full stomach, as do the gourmands of today, but the thing I am referring to is much more important and fundamental.

Another way of putting the thought is that the value of a diet may be modified by both positive and negative factors. There is a definite interplay of the nutritive principles in food in relation to nutrition. This means that a correct diet involves a rather complicated and

sometimes a delicate balancing of a variety of factors. Nutrition, instead of being simple, has become a very complex problem, one which perhaps defies a complete and perfect solution.

But the science of nutrition is still very young, too young to warrant such definite prophesies. Those of us in this field of work sometimes think we can see an ending to the discoveries of new, fundamental nutrients. The same notion has been held many times in the past, even in the past thirty years since modern nutrition thought began. However, we do appreciate how utterly little we know about the real chemical processes of nutrition which go on in the living cells, and how ignorant we are of the interrelationship between the growing list of fundamental nutrient principles which must be supplied in diet; and of another list of chemical substances which the living cells produce from these nutrient principles by chemical processes.

Unfortunately, a rapidly advancing science, for which exact tools of research are still in the formative state, always fosters conceptions and draws conclusions which prove to be false, and must be discarded. This accounts for a good deal of the apparent confusion and contradiction of statements encountered in the scientific writings and pronouncements in this field of work. There is also confusion and contradiction in the popular conceptions regarding food and nutrition. Some of this must be attributed to over-enthusiasm based on imperfect knowledge, and, unfortunately, some must be attributed to selfish propaganda and deliberate and vicious exploiting of the credulity which seems to be inherent in most of us humans, especially regarding food and health.

I feel that all of these unfortunate aspects of the science of nutrition will eventually be cast away and forgotten. It is to be hoped that this will occur without too much detriment to the public health during the process. It is not so surprising that some abuses of knowledge regarding food and nutrition have grown up with this knowledge when one considers the revolutionary character of some of the modern conceptions and the almost spectacular aspect of certain facts which have been established.

The "natural-born" enthusiasts pounced on this knowledge with avidity; it seemed to have such enormous possibilities, both practical and commercial. The consumption of food being a universal necessity, it was easy to allow imagination to run riot and suppose that all hitherto unsolved physical ills might be attributable to improperly selected diets. The next step was to condemn as unfit all foods which lacked any newly discovered essential and to praise extravagantly all foods found to be rich in any newly discovered essential, regardless of how adequately or inadequately both types of food satisfied the other requirements of life.

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Fortunately, we are beginning to adopt a saner view of such matters, although the pendulum swings back discouragingly slowly. We now try to stress the importance for health of choosing proper combinations of foods so as to secure necessary supplemental effects. Indeed, this is essentially the only practical solution we have for the complex chemical problem which confronts our physical existence. Rather early in the development of our present views of nutrition, it came to be recognized that a few kinds of foodstuffs were capable of shifting the balance of practically any ordinary diet into definite stability; these foodstuffs are milk, green vegetables, and citrus fruits. From a practical standpoint, we have not added a great deal in the past few years to that important discovery.

The first great advance in nutrition knowledge was the discovery that foodstuffs undergo very extensive chemical as well as physical disintegration during their passage through that cavity and its appended canal which we know as the stomach and intestines. Here large chemical molecules are reduced in size to a sort of common denominator, or at any rate, to particles beyond the limits of microscopic visibility. No appreciable amounts of the food elements can pass through the walls of this intestinal canal and enter the blood stream for use by the body proper unless their particle size is smaller than one twenty-five-millionth of an inch in diameter. If such a particle were the diameter of a penny, 25 million of them side by side would be 252 miles long. Sugar and salt readily dissolve in water to form particles much smaller than this, but starches and fats and most proteins do not dissolve in water at all, and therefore require the chemical disintegration which we know as digestion.

The next great discovery in the science of nutrition was made between 1780 and 1790 by the French chemist, Lavoisier. He discovered the relation between oxidation of food and animal heat. This discovery was destined a century later to become the foundation of one of the most important schools of nutrition thought and practice, namely that of the calorie or energy value of food.

The energy needs of the body vary greatly with the age of the individual and the occupation. The adult of average weight can maintain life reading in bed on about 1,500 to 1,600 calories per day, but for the usual sedentary occupations and no unusual activities, 2,400 to 2,500 calories are needed. Growing boys in the teenage may require as much as 5,000 calories daily.

Calorie Needs

The calorie school of nutritionists have also measured the extra calories needed for almost every conceivable kind of occupation and activity. The most energy-consuming occupation is that of the lumber jack, who will consume over 8,000 calories daily. The only thing that requires no energy at all is thinking—that is, it requires no calories.

Unfortunately, the potential calories consumed above the needs are not transformed into work and heat, but are laid down as reserve, chiefly in the form of fat. Thus we see how one of the fundamental principles of the nutritive processes may become a social problem, ready-made for exploitation at the victim's expense.

The third great advance in nutrition knowledge came shortly after Lavoisier's discovery of the essential energetics of life. It was the discovery that foods are composed of four major classes of chemical substances, namely, (1) carbohydrates represented by starch and sugars, (2) proteins represented by meat, cheese, egg white and bread gluten, (3) fats and (4) mineral elements represented by the ash residue remaining after the carbohydrates, proteins and fats had been completely burned. This great advance came in the early part of the nineteenth century.

The generally-accepted fundamentals of nutrition at the turn of the present century—representing approximately 150 years of progress—were, (1) foodstuffs must undergo disintegration for the purpose of rendering them available for absorption into the body tissues, (2) a major portion of the food undergoes chemical changes after absorption merely for the purpose of providing kinetic and heat energy, (3) foods are composed of four major classes of constituents, namely, carbohydrates, fats, minerals and proteins, the latter being of special importance for flesh and tissue structures because of their nitrogen containing amino acids.

Iron Needs

As regards the minerals, the importance of iron for the red pigment of the blood had been established as well as the need for iron-containing foods in the dietary. It was known that bones and teeth require calcium and phosphorus. The need for common salt was appreciated to supply sodium and chlorine for the blood and digestive fluids. The importance of iodine in the treatment of goitre had been known for 80 years and the relation of iodine deficiency in food and water to the occurrence of simple goitre had been discovered.

The era of experimental nutrition, which has developed so extensively since 1900, has been dominated by the contribution to knowledge made by the use of the white rat. The results so obtained have been criticized on the grounds that they have no definite bearing on problems of human nutrition. This is justified to a certain extent, because the nutritive requirements of rats are not like those of men in every particular. Nevertheless, they are alike in so many particulars that the contributions of rat nutrition to human nutrition cannot be ignored.

Without reference to chronological order, it may be stated that since the beginning of the "new deal" in nutrition, proof has been furnished (1) that young animals, at least, are unable to form adequate amounts, if any, of one of the long known components of many natural vegetable oils and that this substance is required for their normal well-being; (2) that four mineral elements previously unthought of in connection with nutrition are dietary necessities, possibly for all higher animals, including man, and experimental proof obtained for the first time for the necessity of two other mineral elements, previously regarded as probably necessary; (3) that nine, and under some conditions, eleven, different amino acids may be regarded as indispensable constituents of the proteins occurring in our foodstuffs; (4) that twenty-two

different substances having vitamin effects occur naturally in foods; (5) that man and many other creatures of the animal kingdom utilize certain of the sun's rays for the synthesis in their bodies of a nutrient principle essential for their normal development and well-being.

The discovery of 35 to 40 specific new nutritive substances in a period of 25 years is, in itself, a creditable record for the new science of nutrition. Along with these discoveries there has been established an enormous body of new nutrition knowledge, a great portion of which pertains to the newly-discovered nutritive elements. Many of these discoveries and much of this knowledge is too new to be properly evaluated for practical nutrition. Except where its application is clearly indicated, for example, in the alleviation of disease, the attempt to apply a great deal of this new knowledge, before the true relations of such discoveries to every-day life have been worked out through further careful observation, will almost certainly result in the public being exploited.

Mineral Elements

With regard to the mineral elements, those which have been newly discovered as important for nutrition are copper, manganese, zinc and cobalt. The two mineral elements whose necessity was long suspected, but for which conclusive experimental proof was lacking until recently, are potassium and magnesium. The functions of copper, manganese, zinc and cobalt have so far been disclosed only for animals. Presumably man also requires them, but this has not been demonstrated, except for copper. The quantities needed seem infinitesimal. Less than 1-250,000 of an ounce of copper daily probably suffices, and certainly no more of the others.

During the past thirty years, there has been an enormous growth in knowledge regarding the importance of those mineral elements whose necessity had already been demonstrated, especially calcium, phosphorus and iodine. Although the calcium and phosphorus in the body is found chiefly in the bones and teeth, both elements play such important rôles in other vital functions in our tissues, that it is no longer sound nutrition to ignore their intake if we are to have the sound health which these elements help to impart. This is especially true as regards calcium for although our meat-bread-potato type of diet is relatively rich in phosphorus, in fact, probably supplies all that we need, it is wholly inadequate in calcium. Even the addition of fruits to this type of diet does not help the situation.

Physicians are discovering that long continued calcium deficiency in adults may result in very disturbing digestive, nervous and other symptoms, showing that the foods rich in available calcium cannot be left out of the dietary with impunity. It is here, perhaps more than anywhere else, in our most common dietaries, that milk (and cheese) and green vegetables can exert their important stabilizing rôle. This is especially true with regard to milk, the importance of which in supplying needed calcium and phosphorus is not sufficiently emphasized or appreciated, in my opinion.

The very rapid advances which have been made recently regarding the essential amino acids in the proteins

of our foodstuffs may never have any great practical application for human nutrition, especially if we continue to live on varied diets, because no natural foodstuff lacks completely any of the known dietary essential amino acids. However, their discovery explains, in part, the already established fact that the proteins in animal bodies have a higher nutritive value for animals and humans than those found in plants. The animals require these essential amino acids in order to produce their own body tissues. Therefore their tissues are richer in these essential nutrients. The proteins of milk and eggs have high biological value for the same reason.

The 14 Kinds of Vitamins

The protein requirements for humans cannot be definitely fixed. An ordinary mixed diet containing 2,500 Calories will contain about 3 ounces of protein, which is more than ample for adults even if it is of the vegetable type. The surplus amino acids which are not needed for the building of new body tissue or its repair will be available for meeting the energy needs. As little as one and one-third ounces of first-class protein daily, such as is found in milk, cheese, eggs, fish and meat will furnish the essential dietary amino acids for adult nutrition.

If an adult consumed daily one egg for breakfast and one glass of milk, and one serving ($2/3$ oz.) of cheese for lunch, and one serving (4 oz.) of meat or fish for dinner, the amino acids requirements would always be satisfied, provided the total calories needed are taken care of by the remainder of the diet. Equally important has been the discovery that the proteins in these same foods are able to build up the deficiencies of the poorer proteins in vegetable foods, so that even though one did not consume all his needed protein in the form of milk, cheese, eggs, fish and meat by using them to supply part of his needed protein, the remainder consumed as vegetable proteins need not be as high as might be expected.

The 22 different vitamin substances mentioned may properly be reduced to about 14 different kinds of vitamins. This is because (1) in the case of vitamin A there are known to be four different but related yellow vegetable pigments which, when consumed in the diet, can be changed wholly or in part to vitamin A itself in the body and (2) because there are at least five different, closely related substances which occur naturally and which can cure or prevent rickets, in other words at least five different vitamin D's. Another helpful fact is that at least five kinds of vitamins are probably not of any importance for human nutrition. This leaves nine to consider for our welfare at the present stage of our knowledge. These are, according to the alphabet system, vitamins A, B, C, D, E, G, K, P, and the pellagra-preventive factor, also referred to as the P.-P. factor.

Vitamin Deficiency

Probably the first result of slight vitamin A deficiency is a mild night blindness, which is poor adaptation of the eyesight when passing from a brightly lighted room into the dark. This vitamin therefore plays an important part in our vision.

The optimum requirement of adult humans for vitamin A has been tentatively set as high as 5,000 to 6,000 units per day. It is not especially difficult to get this high amount of the vitamin from natural foods if the proper ones are chosen, although one could resort to the fish liver oils. A teaspoon or two a day of these would be ample. A serving of liver (3 to 4 ounces) will also be sufficient. One-half this requirement would be supplied by $2\frac{1}{2}$ ounces of butter or one quart of milk from properly-fed cows, or by a serving of carrots or one-half serving of truly green vegetable, such as spinach or dandelion greens. Vegetables, however, do not actually furnish vitamin A. They merely supply the yellow pigments from which the vitamin is formed in our bodies.

Severe vitamin B deficiency is the principal cause of the disease beriberi, not common in this country. It is a disease which first affects the nervous system. Its study in the Orient 40 years ago helped open the door to our present knowledge regarding vitamins. Mild deficiency of vitamin B is characterized by poor appetite and other symptoms which are also caused by numerous other morbid conditions. Therefore, if one's appetite is poor, it does not necessarily mean that he lacks vitamin B. It has been estimated that at least 300 and possibly 500 units of this vitamin are needed by adults for optimum health. The higher figure is more than double the amount needed to protect against beriberi. Vitamin B is rather widely distributed in our ordinary foodstuffs such as whole cereals, eggs, milk, meat, vegetables and citrus fruit juices, but no one of them is especially rich in this important nutrient.

Lack of vitamin C terminates in the disease, scurvy. Vitamin P, a newly discovered vitamin which accompanies vitamin C in nature, is concerned with some of the changes which occur in the blood vessels in scurvy, particularly with their fragility. The symptoms of scurvy are numerous and very distressing. The disease may be fatal. However, definite scurvy is quite rare, although mild or latent scurvy is believed to be very common. This would seem surprising in view of the abundance of the vitamin in our modern civilization and the ease with which the requirements may be met.

Dietary Needs

Almost all our domestic animals and household pets are more fortunately situated than we are with respect to vitamin C. They do not need dietary supplies, because they make the vitamin in their own bodies, out of what and by what process we do not yet know.

There is evidence that we can store 50,000 to 60,000 units, enough to last a few months if need be, although we would probably know something was the matter before that time was terminated. Certain fruits and vegetables which we normally eat in the raw state are the important rich sources of vitamin C, such as grapefruit, oranges, strawberries, tomatoes, cabbage and watercress; Irish potatoes are also important. Three to five ounces of any one of these foodstuffs will supply from 1,000 to 1,200 units of vitamin C, sufficient to keep the body saturated under normal conditions. Many other fruits and vegetables contribute significant amounts although not so generously.

Vitamin D is one of the two important vitamins required by humans, a serious deficiency of which affects many individuals. A curious fact is that humans do not suffer from lack of vitamin D primarily because of improper choice of natural foodstuffs. Natural foods are never sufficiently rich in this vitamin to provide the necessary amounts.

An important fact is that the need for this vitamin is conditioned in part by the intake of calcium and phosphorus. This is also true for animals other than man. A third aspect of this matter has to do with the revolutionary discovery that higher animals in general, including humans, form the essential vitamin D in their own bodies when exposed to the rays of the sun. Since it is only certain of the short rays of the sun which produce this result, namely the invisible ultraviolet rays, we have the explanation for the occurrence of most cases of vitamin D deficiency, namely, insufficient exposure to the right kind of sun rays. This may be caused by several circumstances, one of which is not related to the mistaken idea that sunlight to be beneficial must be enjoyed "all over." There is ample evidence that only a small portion of the skin need be exposed to secure the benefits of those vitamin D synthesizing rays which are able to reach us.

Vitamin E is concerned primarily with certain reproductive processes and functions. The requirements are as yet unknown. Many natural foods contain it. Because of the types of functions involved, this vitamin lends itself especially to vicious exploitation.

An apparently important vitamin for human welfare is vitamin G. The vitamin has been identified and is available as a synthetic product. Its fundamental function in animal life has been established. The effects of deficiency of this vitamin in certain laboratory animals are well-established, but these vary with the species. In rats there is lack of growth, loss of hair, and cataract of the eyes. Except for the lack of growth, these symptoms do not occur in dogs and chicks. In fact, they are not specific. The effect of lack of vitamin G in man is not known. A unit of the vitamin has been developed based on growth of young rats. Humans are thought to need 600 to 800 such units daily. This should be very easy to attain, because the vitamin is found abundantly in milk, eggs, meats and green vegetables; also to some extent in seeds and fruits.

The Pellagra-Preventing Vitamin

Next to vitamin D, the most important vitamin deficiency which concerns us in America is that of the pellagra-preventing vitamin. There are said to be 200,000 cases of pellagra in the United States, chiefly in the South. The symptoms are repulsive, and include many mental disturbances. It is a disease of poverty associated with a very restricted diet. Evidence is now very encouraging that the vitamin concerned has been identified with a long known organic chemical, namely, nicotinic acid. There is no unit for this vitamin and the human requirements are not known. The foodstuffs which contain the vitamin have been established by experimentation with dogs which develop a canine counterpart of the human disease, and by clinical practice among

the unfortunate victims. Brewers' yeast is known to be especially rich in the pellagra-preventing vitamin, and the most effective foods are milk, meats and eggs, also some green vegetables. The vitamin occurs in many foodstuffs which are also rich in vitamin G. For this reason, it seemed at first very probable that vitamin G was the pellagra-preventing vitamin. It was only when vitamin G was isolated that this hypothesis was demonstrated to be false—another triumph for experimental nutrition.

Until recently vitamin K was not regarded as important for human welfare. This vitamin is essential for the formation of certain blood clotting principles and is thus concerned with blood coagulation. The vitamin appears to be formed in the digestive tract under normal conditions so that dietary supplies normally are not necessary.

In conclusion, may I point out that these biochemical discoveries which I have been discussing serve to show wherein man can in the future exert a greater control

over his environment. Some writers believe that future investigations into problems of nutrition depend largely on what form society takes. However, fundamental problems will continue to be attacked regardless of social and political changes. The new discoveries definitely call for a higher standard of diet, as well as one which at present calls for greater expenditures of money. If diet and nutrition are as important in determining health as these new discoveries suggest, human welfare will demand an abundant food supply of the proper sorts and either adequate income to buy it or a cost level within the reach of income.

The solution of a problem as complicated as this will require the combined efforts and best thought and knowledge of food producers, industrialists, economists and nutritionists. Government, divorced from politics, must also contribute. And chemistry may be able to do its bit by making the important vitamins available at a price such that optimum supplies of these essential nutrients above those normally consumed in the diet, can be insured for all.

Acute Anterior Poliomyelitis*

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MUCH has been written concerning the symptomatology, diagnosis and treatment of acute anterior poliomyelitis. However, it has been many years since the last study of poliomyelitis in Minnesota and the Northwest was reported. An analysis of 68 cases, admitted to the University and Minneapolis General Hospitals from July 1, 1937, to December 31, 1937, has permitted this most recent review concerning this disease. In all these cases, the diagnosis of acute anterior poliomyelitis was made after careful clinical and thorough laboratory investigation. For economy of space and for the sake of clearness, the data is presented in more or less outline form.

Poliomyelitis is an acute contagious disease characterized in the majority of cases by preliminary variable general manifestations, and followed in many by evidences of acute involvement of the central nervous system which in some leads to irregularly distributed paralysis sufficient to cause death or produce disabilities.¹ As to the etiology, the exciting organism has never been definitely established.

1. *Negative Results*—Earlier workers in the field of bacteriology were unable to determine any microorganism as the cause of this disease. Flexner and Lewis² and others concluded that in the

few cases in which the bacteria were found, they must be regarded as accidental.

2. *Streptococcus*—Mathers,³ in 1916, after isolating the streptococcus, believed that he had found a solution to the problem and later Nuzum and Willy⁴ found organisms similar to those described by Mathers. Rosenow^{5,6} has advocated the streptococcus as the etiological agent. However, his opponents contend that the cocci are air-borne contaminants, or under certain circumstances are terminal invaders, probably from the nasopharynx and have no etiological relationship to poliomyelitis.
3. *Globoid Bodies*—In 1913, Flexner and Noguchi⁷ described minute structures called "globoid bodies" which could be grown by special methods anaerobically from the nervous tissue of human or animal origin or from filtrates of such tissues. They expressed the view that an etiological relationship existed between the cultivated microorganisms and human or experimental poliomyelitis. Flexner⁸, in a subsequent report in 1928, doubted that these "globoid bodies" are the causal factor.
4. *Virus*—There is now a preponderance of evidence and general acceptance that the disease is caused by a filtrable virus.

Until recently, there has been almost a universal acceptance of the theory that the virus enters the human

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body through the upper respiratory tract, specifically through the olfactory tract, and thence *via* its fibers to the central nervous system. Lately, Toomey⁹ has been active in advancing the gastro-intestinal tract as the portal of entry. He has conducted numerous experiments to prove his theory, and has been successful in reproducing the disease in monkeys by injection of the virus subserosally or into the gut between two clamps. He claims that the central nervous system is invaded *via* the sympathetic fibers. His experimental method of reproducing the disease is criticized as being too drastic. On the other hand, Trask and Paul¹⁰ have shown that some strains of poliomyelitis virus can readily infect monkeys on intracutaneous inoculation of doses which are not particularly large.

The disease is probably conveyed from person to person by secretions of the mucous membranes of the nasopharynx. The principal method of spread is believed to be by healthy human carriers. Contaminated milk and water occasionally have been observed to spread the disease. Poliomyelitis is not very contagious. Only two of the hospital employees of the Minneapolis General Hospital contracted the disease: a nurse who was working in the outpatient medical and pediatric services, and an orderly working in the nurses' home. None of the nursing or medical staff in the contagious disease department suffered any symptoms suggestive of poliomyelitis. Except in the Los Angeles epidemic of 1934, in which 15 per cent of the personnel of the contagious unit contracted the malady, observations indicate that many people have contracted milder forms of the illness and thus have developed immunity. The period of contagiousness is unknown.

The epidemiology of this disease is a perplexing one. There is as yet no test by which individuals who are susceptible may be distinguished from those who are not, except the failure of their serum to neutralize the virus. Whether this is a true test of susceptibility or not, it is impracticable for general use.

1. *Incidence*—Reports indicate that the incidence throughout the world seems to be increasing, probably due to a better understanding of the disease or the requirement of many health departments in making the disease reportable. A survey of public health reports shows that the incidence in the United States increases as one proceeds North. Fischer and Stillerman¹¹ report

an incidence in New York of 27 cases per 100,000 population for the year 1935, and Leake, quoted by these authors, gives an average incidence of ten cases per 100,000 people per year. The annual incidence in the Minneapolis General Hospital, the city of Minneapolis, and Minnesota, for the respective years are shown in Table 1. During this period the population of Minneapolis increased from 390,000 to 490,000 and that of the state from 2,200,000 to 2,600,000.

A. *Rural and Urban Incidence*—It has been reported that there is a proportionately greater rural prevalence and that the case and death rates are also higher in the rural districts and small towns than in the densely populated areas.

B. *Seasonal Incidence*—Although in the south temperate zone, the greatest incidence of poliomyelitis is in March and April, it is characteristically a disease of summer and early fall. The period from July to October in Minnesota is the season of maximum prevalence. Epidemics have their onset during the warm weather and ordinarily disappear with the cold weather. No adequate explanation of this seasonal variation has been made. In the Northwest the greatest incidence is in the month of September. This is borne out by Table 2.

TABLE 2
Seasonal Incidence of Poliomyelitis in the Minneapolis General Hospital (1937) and in Minnesota (1925-1936)

Month	Minneapolis General Hospital	Minnesota
July	0	380
August	20	880
September	36	1,010
October	7	560
November	3	205
December	2	50

C. *Age*—The incidence of poliomyelitis in children under one year is lower than in the years immediately succeeding. This has been attributed to a passive immunity in infants shown by the demonstration of Aycok and Kramer¹² that the neutralizing power of the serum from the cord blood of 11 out of 12 newborn infants corresponds to that of their mothers. The majority of the cases fall between the ages of one and 14. It has been reported that there is a slight rise of cases at the time of puberty with the female curve showing a little earlier rise than the male curve. The age incidence in the Minneapolis General Hospital, of Minneapolis, and for Minnesota is clearly shown in Table 3.

TABLE 3
Age Distribution of Poliomyelitis in the Minneapolis General Hospital (1937), of Minneapolis (1931-1936) and for Minnesota (1914-1936)

Age Groups in Years	Minneapolis General Hospital	City of Minneapolis	Minnesota
Under 1	0	2	150
1 to 4	21	65	1,680
5 to 9	14	65	1,635
10 to 14	18	58	1,075
15 to 19	6	27	635
20 to 24	4	16	375
Over 25	5	26	323

D. *Sex*—A study of the statistics will show that poliomyelitis consistently attacks more males than females. The ratio between the sexes has varied somewhat in different epidemics, but excess of males over females is one of the most constant epidemiological features of this disease. No satisfactory explanation of this peculiarity

TABLE 1
Number of Cases of Poliomyelitis in the Minneapolis General Hospital, City of Minneapolis, and Minnesota

Year	Minneapolis General Hospital	City of Minneapolis	Minnesota
1921	10	45	702
1922	1	4	51
1923	1	4	80
1924	—	11	136
1925	26	90	950
1926	14	5	47
1927	7	15	138
1928	14	34	223
1929	14	4	50
1930	13	46	475
1931	65	143	810
1932	8	10	122
1933	42	94	383
1934	9	9	109
1935	6	13	98
1936	6	8	31
1937	68	95	358

has been observed. The sex incidence in the Minneapolis General Hospital, the city of Minneapolis, and Minnesota is summarized in Table 4.

TABLE 4
Sex Incidence and Ratio of Poliomyelitis

	Male	Female	Ratio
Minneapolis General Hospital (1937) ..	34	34	1:1
City of Minneapolis (1931-1936) ..	167	111	1.5:1
Minnesota (1914-1936) ..	3,342	2,431	1.4:1

E. *Age and Sex Incidence*—Table 5 presents the relationship between age and sex incidence arranged according to standard age groups and reveals the fact that at all ages, more males develop the disease than females.

TABLE 5
Age and Sex Incidence in Minnesota (1914-1936)

Age Groups in Years	Male	Female
Under 1	80	65
1 to 4	1,025	800
5 to 9	955	670
10 to 14	576	390
15 to 19	379	240
20 to 24	227	150
Over 25	190	130

F. *Case Fatality*—In general, the case fatality is inversely proportional to the number of cases. It is high in years of low prevalence and low in years of high prevalence. In the Minneapolis General Hospital during the 1937 period studied, there were 11 fatalities out of a total of 68 cases or a case fatality of 16 per cent. Out of the 11 deaths, five were females and six males. Table 6 gives the case fatality in Minneapolis and Minnesota.

TABLE 6
Poliomyelitis Cases and Deaths Reported from Minneapolis and in Minnesota

Year	City of Minneapolis			State of Minnesota		
	Cases	Deaths	Fatality*	Cases	Deaths	Fatality*
1921	46	10	22	702	102	15
1922	4	1	25	51	20	39
1923	4	2	50	80	17	21
1924	11	2	18	136	31	23
1925	90	10	11	955	145	15
1926	5	0	0	46	15	33
1927	15	3	20	139	36	36
1928	34	12	35	224	57	25
1929	4	1	25	32	6	19
1930	46	2	4	479	37	8
1931	144	14	10	811	66	8
1932	10	2	20	124	10	8
1933	94	10	11	383	37	10
1934	9	5	56	113	21	19
1935	13	2	15	99	10	10
1936	8	1	13	37	4	11
1937	95	15	16	353	47	13

* These figures represent case fatality in per cent.

G. *Case Fatality by Age Groups*—The case fatality by age groups for Minnesota during the period 1914-1936 is presented in Table 7. It is seen that the greatest death rate occurs in the patients under one year and in those over 25 years of age. The lowest rate is in the period between five and nine years of age in which there is also the highest incidence of the disease.

TABLE 7
Case Fatality by Age Groups in Minnesota (1914-1936)

Age Groups in Years	Case Fatality per Cent
Under 1	28
1 to 4	14.5
5 to 9	10
10 to 14	15
15 to 19	18
20 to 24	24
Over 25	33

2. Other interesting observations were made. The

following factors were investigated because many physicians have made inquiries concerning them.

A. *Family Incidence*—The size of the family does not seem to influence the incidence of the disease. The average size of the family was 4.6. The number of children under 20 years in the family including the patient was 2.8. Seven families out of the 68 cases had other children at home ill with grip-like symptoms. No multiple cases occurred.

B. *Second attacks*—Quigley,¹³ in 1934, cited 11 cases of second attacks from the literature. He added one case of his own. Fischer and Stillerman¹¹ report another case in the New York epidemic of 1935. There were no cases of second attacks in our series.

C. *Exposure*—There were 12 cases with a definite history of exposure.

D. *Swimming*—Of the 68 patients, 23 cases gave a history of having gone swimming in lakes in and about Minneapolis within a month prior to their illness.

E. *Visits Out of City*—Only 17 cases had been out of the city within one month before they became ill.

F. *Race*—No absolute racial susceptibility or resistance to poliomyelitis has been demonstrated. Two out of 68 cases were negroes.

3. *Susceptibility of Blood Groups*—In the Roumanian epidemic of 1927, it has been reported that Groups I and IV (Moss) predominated. Jungeblut and Smith,¹⁴ in a study of 578 human poliomyelitis sera in the New York City epidemic of 1931, stated that Group B (Moss III) furnished fewer cases in persons over five years of age, a greater percentage of normal persons of this group neutralized the virus *in vitro* than of other groups, and pooled sera of this group neutralized in a higher dilution than that of other groups. Cowie, Parsons, and Lowenberg¹⁵ reported that in the mild or pre-paralytic cases the greatest number belongs to Groups III and IV (77 per cent), whereas with severe poliomyelitis in paralytic stages most cases occurred in Groups I and II. The findings of the above investigators have not been substantiated by others. Our figures summarized in Table 8 do not show any correlation between the blood groups and the incidence of poliomyelitis or the severity of paralysis.

TABLE 8
Relationship Between Poliomyelitis and Blood Groups

Incidence—Per Group	Cent of Cases				Type of Paralysis—Group	No. of Cases			
	I	II	III	IV		I	II	III	IV
Normal	4	43	12	41	Spinal paralytic	0	3	1	10
Other inves- tigations	0	56.4	14.5	29.1	Bulbar paralytic	0	2	1	5
Our Series	0	54.6	4.5	40.9	Diffuse paralytic	0	3	0	0
	0	41.7	8.3	50.0	Non-paralytic	0	8	1	3

4. *Relationship of Tonsillectomy to Incidence*—Aycok and Luther¹⁶ in 1929 reported 16 cases of poliomyelitis following tonsillectomy of which 11 were of the bulbar form. Silverman¹⁷ reported five cases, all of which were of the bulbar type. Fischer and Stillerman¹¹ reported ten cases, five of which were of the bulbar form, whose incidence throughout the epidemic in New York City in 1935 was only ten per cent. In our series one patient had tonsillectomy two weeks prior to admission. He developed a bulbar form with respiratory paralysis and died. The fact that tonsillectomy does

not alter the incidence of the disease can be seen in the following table.

TABLE 9
Tonsils In or Out

No. of Cases	Tonsillectomy	No Tonsillectomy	Undeterm.
68	32	34	2

The symptoms and signs of poliomyelitis are well-known. We have investigated the type of onset, and have found that the gastro-intestinal symptoms lead the respiratory. The fever which was found in practically all of our cases reached a rather high level, the average being 103.9° F., and the duration from the time of onset of the disease was about 6.7 days. The paralysis which accompanied the infection was very closely followed. The time of onset of the paralysis, the types of paralysis, the residual paralysis, and the location of the paralysis, were all noted. Of great interest was the finding that paralysis of the muscles of the trunk and abdomen is more frequent than one is expected to believe and is often unsuspected. All data concerning the symptoms and signs of poliomyelitis as revealed by our cases follows in outline form:

1. Types of Onset of the Presenting Symptoms:			
A. Cerebral and meningeal	30 cases	43.5%	
B. Gastro-intestinal	20 cases	30.4%	
C. Respiratory	18 cases	26.1%	
2. Frequency of Different Symptoms and Signs on Admission:			
Fever	66	Drowsiness	23
Stiff neck	56	Anorexia	23
Pain in extremities, neck or back	52	Bulbar paralysis	17
Headache	47	Difficult swallowing	17
Vomiting	42	Difficult speech	17
Constipation	41	Nausea	16
Spinal paralysis	30	Irritability	13
Kernig's test	30	Difficult respiration	9
Upper respiratory infection	23	Urinary symptoms	8
		Hyperesthesia	8
		Photophobia	5
		Tremors and twitchings	3
		Convulsions	1
3. Important Factors Concerning the Fever:			
A. Maximum temperature (rectal)		105.8 F.	
B. Average maximum temperature		103.9 F.	
C. Average temperature on admission		101.6 F.	
D. Average duration of temperature from onset of the disease:	Days		
Non-paralytic cases	6.0		
Spinal paralytic cases	7.4		
Bulbar paralytic cases	7.0		
All cases	6.7		
4. An Analysis of the Paralysis:			
A. Onset of illness to paralysis:	Days		
Spinal paralysis	5.1		
Bulbar paralysis	4.85		
All cases	4.97		
B. Types of paralysis:	Cases		
Spinal paralysis	22		
Bulbar paralysis	15		
Bulbo-spinal paralysis	6		
Total (63.2 per cent)	43		
C. Residual paralysis excluding deaths:	Cases		
Spinal	18		
Bulbar	0		
Total (26 per cent)	18		
D. Location of paralysis:	Cases		
Lower extremities—			
One lower extremity	5		
Both lower extremities	6		
Total	11		
Upper extremities—			
One upper extremity	3		
Both upper extremities	3		
Total	6		
Both upper and lower extremities	5		
Trunk and abdomen	14		
Intercostals and diaphragm	3		
Bulbar—			
Pharyngeal	7		
Pharyngeal and respiratory	6		
Facial and pharyngeal	1		
Facial	1		
Bulbo-spinal	6		
Total	21		

The laboratory data has always been of great interest to observers. Some have placed a great deal of emphasis on it in the hope of working out some method by which poliomyelitis could be more easily diagnosed. Others have not given it very much attention, because the results of their investigations have been rather inconsistent. In this study a special analysis of the white blood cell counts and the spinal fluid finding was made.

1. *White Blood Cell Counts*—The majority of the leucocyte counts were at the level of high normal and did not show any correlation with the temperature. In one case the lowest count was found at the time the temperature of the patient was 103.5° F. This indicates that the blood response and presumably the antibody response was slow or absent, and may explain the findings of numerous investigators that the antibody content of the blood of recently recovered patients is low or absent. Patients with complications such as pneumonia or those in the terminal stage were not included. The minimum count was 4,750, and the maximum was 14,400. In the abortive cases the count averaged 8,200, in the non-paralytic cases it was 8,500, in the cases with spinal paralysis the average figure was 8,600 and in the bulbo-spinal patients it was only 8,200. For all types of the disease, the average was 8,900 cells.

2. *Spinal Fluid Findings*—Many of the spinal cell counts were below 100. The spinal paralytic cases had the highest average count. The pure bulbar types had the lowest average count. Three severe spinal paralytic cases showed normal cell counts on the third, fourth and eighth days of the disease respectively. Three bulbar paralytic cases had normal counts on the second, eleventh, and fourteenth days of the disease. Several instances were observed in which one or two spinal taps were negative, but subsequent punctures showed elevated counts. These findings show that the spinal fluid is very unreliable in the diagnosis of the disease, especially if only one examination is made. One patient showed a cell count of 7,000 cells with a very cloudy fluid. He was treated with one per cent sulfanilamide solution intraspinally and subcutaneously. The next day the count was 1,000, but on the third hospital day he developed a flaccid paralysis of the right arm. No organisms were isolated. The spinal fluid sugar determinations were within normal limits in all instances. The spinal fluid findings are summarized in Table 10 and the average change in the differential pictures as the disease progressed is revealed in Chart 1.

TABLE 10 Spinal Fluid Findings Averages in Elevated Cell Counts with Differential and Sugar				
	Total Count	Polymorpho-nuclear Per Cent	Mono-nuclear Per Cent	Sugar Mg. per 100 cc.
Abortive	—	—	—	63
Non-paralytic	81	49	51	59
Spinal paralytic	138	35	65	66
Bulbar paralytic	63	23	77	67
Bulbo-spinal	40	31	69	57

Poliomyelitis may be divided into several types. All physicians do not agree with this division of the disease, but, nevertheless, the classification is presented in the hope that it may be of diagnostic value.

1. *Abortive*—Cases with typical poliomyelitis symp-

toms and signs, but with no paralysis and with negative spinal fluid findings.

2. *Non-paralytic*—Cases with positive spinal fluid findings and with involvement of the central nervous system, but with no paralysis.

3. *Encephalitic*—Cases with positive spinal fluid findings, with or without upper motor neuron paralysis or convulsions, characterized by marked disturbances of sensorium, extreme and prolonged drowsiness and stupor.

4. *Paralytic*—Cases with typical symptoms and with flaccid paralysis.

The different types of poliomyelitis encountered in the Minneapolis General Hospital during the three years of highest incidence are summarized in Table 11.

TABLE 11
Incidence of the Type of Poliomyelitis in Minneapolis General Hospital

	1937	1933	1931
Abortive	6	0	1
Non-paralytic	18	17	31
Encephalitic	1	0	1
Paralytic—			
Spinal	22	19	27
Bulbar	15	7	4
Bulbo-spinal	6	4	1

Interest also has been shown in the diseases which are commonly in their early stages confused with the pre-paralytic period of poliomyelitis. Admitted to the hospital as cases of poliomyelitis were patients who later were definitely diagnosed as follows:

Acute upper respiratory infection	14 cases
Pneumonia	3 "
Gastro-intestinal disorders	2 "
Trauma to back	2 "
Meningococcic meningitis	1 "
Pneumococcic meningitis	1 "
Benign lymphocytic meningitis	1 "
Acute laryngitis with some obstruction	1 "
Rheumatic heart disease	1 "
Subacute bacterial endocarditis	1 "
Acute pyelitis	1 "
Acute salicylate poisoning	1 "
Malaria	1 "

As to prophylaxis, active immunization receives first consideration. Various attempts have been made to induce active immunity experimentally. The results have all been confusing and inconclusive. There is as yet no satisfactory means of active immunization. Increase in the antibody content of the blood has been achieved, but whether this is a true measure of immunity or not is questioned. Theoretically, what is desired is an increase in tissue immunity, and not an increase in the humoral antibodies. The effect of any method of immunization, therefore, cannot be evaluated. The following two methods of active immunization attract attention at the present time:

1. Kolmer's vaccine—Being convinced that effective vaccination against poliomyelitis requires the administration of an active virus, Kolmer¹⁸ has developed a vaccine for the immunization of monkeys and human beings. It consists of a four per cent remote monkey passage virus attenuated with one per cent sterile solution of sodium ricinoleate, and later modified to include a small amount of phenyl-mercuric nitrate (1:80,000) for pro-

tection against contamination. After suitable monkey experimentation, he inoculated susceptible children with this attenuated virus and proved that neutralizing antibodies were produced in over 80 per cent of the vaccinated individuals. The dosage advocated was three injections of 0.25, 0.5, and 0.5 cc. at intervals of one week for children one to three years of age, with slightly larger doses for older children. Kolmer has vaccinated over 11,000 individuals of which 91 per cent had no reactions. Nine per cent had slight reactions comparable to those produced by injections of diphtheria toxoid. Among approximately 11,000 individuals, poliomyelitis developed in ten individuals who had received one or two doses of the vaccine. No instance of poliomyelitis developed after three full doses of vaccine. The killed virus is probably safe if given subcutaneously, but certainly might be dangerous if given otherwise. In spite of Kolmer's observations, the immunization value of his vaccine is greatly doubted.

2. Brodie's vaccine—Brodie,¹⁹ believing that monkey passage virus is still infectious for man, has prepared a germicidally-inactive spinal cord virus to which is added 0.1 cc. formalin. Since intraperitoneal inoculations have failed to infect monkeys, he believes that the vaccine is safe. He administers 1 to 2.5 cc. intracutaneously, and the remainder of 5 cc. subcutaneously in the abdomen, and has repeated the injection after 10 to 14 days. About 9,000 individuals have received the vaccine. Less than one per cent of the vaccinated had general reactions, and less than two per cent had local reactions. The vaccinated group included 564 individuals who received the injections after a definite history of exposure. Three of these developed the disease on the day of injection, and one 13 days later. Inasmuch as it takes three weeks to obtain full response from the vaccine, Brodie believes that one cannot expect protection after exposure.

Zinc sulfate prophylaxis had its start with the observations of Olitsky and Cox,²⁰ in 1934. They showed for the first time that mice receiving a number of nasal instillations of tannic acid were rendered resistant to subsequent infections with equine encephalomyelitis virus injected by the nasal route. In May, 1935, Armstrong and Harrison,²¹ of the United States Public Health Service, reported that monkeys treated intranasally with a four per cent alum solution exhibited a high incidence of resistance to subsequent instillation of virus. Some months later, Sabin, Olitsky, and Cox,²² of the Rockefeller Institute, confirmed these observations and reported that four per cent tannic acid also exercises a protective action. In 1936, Schultz and Gebhardt²³ showed that a solution of zinc sulfate gave a more lasting and a higher degree of protection than any other of the chemical agents, of which there were over 40. Because of its simple composition, relatively low toxicity, surprisingly high protective action in monkeys, and the fact that zinc sulfate in a concentration of one per cent protects an animal for at least three weeks against repeated intranasal instillations of an active virus, they have recommended a trial in human beings. This procedure presupposes that the portal of entry of the virus is the olfactory tract.

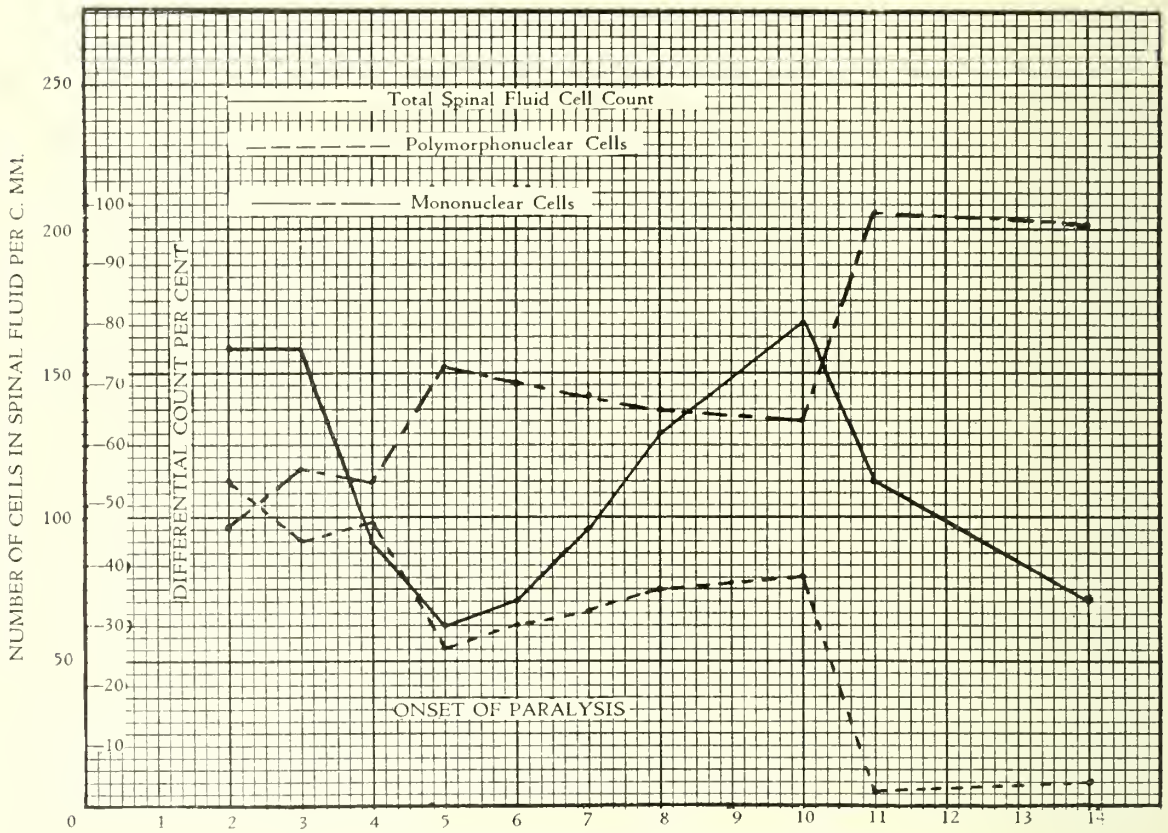


Chart 1. Daily Spinal Fluid and Differential Cell Counts in Poliomyelitis

To minimize, and in many cases, eliminate the discomfort that follows high intranasal instillations of the chemical, Peet, Echols, and Richter²⁴ of Michigan have added one per cent pontocaine solution as a local anesthetic, and have found that it is relatively non-toxic, and in no way decreases or alters the protective value of zinc sulfate. They have therefore recommended a solution containing one per cent zinc sulfate, one per cent pontocaine hydrochloride, and 0.5 per cent sodium chloride to make the solution more nearly isotonic. However, they have observed that the actual application of the chemical solution to the olfactory area is more difficult than was anticipated. As a result of this observation, they have devised an atomizer with a special spray-tip to be introduced under direct vision to the region of the cribriform plate. One cubic centimeter of the solution is sprayed over each olfactory area. Schultz and Gebhardt²⁵ recommended one instillation once every two weeks during weeks when the risk of the infection is great. A more desirable procedure would be to apply the solution for two or three successive days, and once every two weeks thereafter.

Lately, Tisdall²⁵ and his co-workers reported their experiences with the zinc sulfate spray in Ontario, Canada. They gave 5,233 children one spraying with no serious complications. Of 740 children tested, 25 per cent had anosmia. There were 6,300 children who served as controls. In the 4,713 children who were sprayed twice, 11 cases of poliomyelitis occurred. In the control group of

6,300 children, 18 cases developed poliomyelitis. The attack rate in the period from seven days after the first spraying to 30 days after the second spraying was 2.1 for the sprayed group, and 2.9 in the control group. These figures are not statistically significant. The conclusion reached is that since the spraying technique is difficult to perform properly by the general practitioner, and cannot be done quickly enough to meet the emergency of an outbreak, it is not considered a practical prophylactic procedure.

A survey of the literature fails to indicate that passive immunization is more than a doubtful procedure in the prevention of poliomyelitis. There are some reports which show that occasionally the administration of convalescent serum to large groups of individuals lowers the incidence of the disease in these communities. Further studies are indicated.

The treatment of poliomyelitis is one of the foremost problems of the present century. Besides rest, sedation, expert nursing care and early orthopedic therapy in placing the paralyzed limbs at rest, the treatment of the disease has involved the use of various sera, the discussion of which follows:

1. *Introduction*—Recent reports in the literature have not yet proven the efficacy of serum therapy. Most investigators using their particular sera have demonstrated their neutralizing value, but it has not been shown that the neutralizing potency of sera against the virus of poliomyelitis is a true measure of their therapeutic activ-

ity. There is no satisfactory laboratory method of testing the potency of the various types of sera except by neutralization tests, and until such a method is found, the results of serum therapy will always be in doubt unless carefully controlled studies in a large series of cases by different workers can show uniformly beneficial clinical results.

2. *Types of Sera*—If serum is used there are three types available:

- A. Antistreptococcic serum of Rosenow.
- B. Antiviral animal sera.
- C. Human adult or convalescent sera.

3. *Mode of Administration*—Originally sera were given only intraspinally, then intraspinally and intramuscularly or intravenously. Recently the tendency has been more toward intravenous therapy, favoring large doses of 100 to 600 cc. of serum. Harmon, Shaughnessy, and Gordon²⁶ claim that when serum is given to monkeys intraspinally, it appeared to set up an aseptic meningitis which hastened the advent of paralysis. Park,²⁷ in an important contribution, made a comparison of the results obtained by the various methods of administration and could find no difference in the outcome.

4. *Antistreptococcic Serum of Rosenow*—Rosenow²⁸ states that in connection with his serum, paralysis did not occur in a single instance when treatment was begun before its onset, and all recovered. No extension occurred following the giving of the serum in the patients who recovered and in whom paralysis was marked at the time of serum treatment. The majority of investigators have been unable to obtain the remarkable results claimed by Rosenow.

5. *Antiviral Horse Sera*—

- A. Pettit's horse serum.
- B. Park's concentrated horse serum.
- C. Toomey's hyperimmune antipoliomyelitis horse serum.

All of these different types of sera have their proponents, but results have not been uniform, and their value is doubtful. Toomey,²⁹ who believes that the portal of entry of the virus is the gastro-intestinal tract, has experimentally shown that in monkeys the disease is produced only when the virus factor is combined with the toxic factors that are present in the gastro-intestinal tract as a result of intestinal stasis. By injecting virus suspended in saline solution together with an enteric toxin filtrate ("fortified" antigen), he has developed a hyperimmune antipoliomyelitis horse serum. This serum has been distributed by Toomey for experimental purposes. It was used in three of our cases, one non-paralytic, one paralytic, and one bulbar. The results were discouraging.

6. *Convalescent Human Serum*—Early workers showed that serum from monkeys in the convalescent stage of the experimental disease contained a substance that prevented infection when serum and virus were incubated *in vitro*. Others demonstrated that serum from persons who had recovered from a paralytic attack of the disease had similar neutralizing substances in the blood stream. It was then assumed that neutralizing

substances would be virucidal *in vivo*. Convalescent serum was used for the treatment of poliomyelitis in man. However, convalescent sera which did not contain the neutralizing antibodies were found. It appeared that constitutional factors such as blood groups had a bearing on the acquisition of neutralizing substances. Jungeblut and Smith¹¹ discovered that the serum of individuals of Group III (Moss) neutralized very readily the virus *in vitro*. Furthermore, evidence became available indicating that there is a great probability of obtaining a more potent serum several months after an attack, rather than a few days after the onset of paralysis. Park²⁷ tested the serum in a number of cases in the New York City epidemic of 1931, and found that the antibody first appeared some weeks or months after convalescence. Howitt³⁰ demonstrated that patients showing complete recovery after a transient or only slight paralysis gave more evidence of the production of a potent serum than those in which severe paralysis developed.

Aycock and Luther¹⁶ and others reported favorable results with the administration of convalescent serum. Harmon,³¹ in 1934, reviewed the literature and collected over 4,000 cases, with the conclusion that the value of convalescent serum is very doubtful. Ten of the 68 cases of this study received convalescent serum. Administered during the pre-paralytic stage, it did not prevent the onset of paralysis; neither did the paralyzed patients receiving the serum benefit from it. However, blood transfusions utilizing whole blood were of definite value in tiding some of the patients over the critical stage of the disease. All the severe cases of poliomyelitis have shown during the acute stage a rapid and irregular pulse with a marked fall in the blood pressure—symptoms indicative of shock. The fact that blood transfusions have helped these cases has not been doubted.

Recently, *in vitro* experiments have shown that sera of normal adult individuals who have never had the paralytic type of disease or who live in areas where the disease is rare or absent, have an equal or even a higher degree of neutralizing power than the convalescent sera. Six of the 68 cases of this study received serum from normal adult persons. It was administered by giving the patients whole blood transfusions. The results tend to show that normal adult serum in the form of large transfusions is the treatment of choice, because of its availability, in all cases where serum may be indicated.

Seventeen patients were treated with sulfanilamide in large doses without any beneficial results. These negative results with this drug in treating virus infections raise certain questions regarding the mode of its action, particularly in view of a few bacterial diseases in which it is apparently highly efficacious. One of the essential differences between virus and bacterial infections is that the former are invariably of an intracellular nature, while the latter are chiefly intercellular, although in some bacterial diseases cellular invasion is also characteristic. It is suggested that sulfanilamide is unable to exert its action against the infecting agent when it has invaded the tissue cells as in the case of virus infections.

The barospirometer for artificial respiration was first described in 1925. The patient was entirely enclosed in

an air-tight cylinder. Drinker,³² in 1928, modified the barospirometer so that the patient's head could remain outside the cylinder. Since then, the Drinker respirator has been widely used for the treatment of respiratory failure in poliomyelitis. Of the 68 cases at the Minneapolis General Hospital, the Drinker respirator was used in nine cases. In addition, six cases were treated and observed at the University Hospital. Eight of the 15 patients survived. It was learned from this small group of cases that if certain factors concerning the Drinker respirator treatment are considered, fairly good results may be obtained. The physician must familiarize himself with the following:

1. *Indications for Respirator Therapy:*

- A. In intercostal or diaphragmatic paralysis or both, the respirator is ideal.
 - B. Intercostal and diaphragmatic paralysis with disturbances in swallowing.
 1. If the paralysis is unilateral as indicated by difficulty in swallowing, the respirator may be effective in some cases.
 2. If the paralysis is bilateral as indicated by total inability to swallow, the respirator is ineffective.
 - C. Intercostal and diaphragmatic paralysis associated with paralysis of bulbar cranial nerves other than those involved in swallowing respond favorably.
 - D. Pure bulbar types with presumably central respiratory paralysis do not respond. In fact, some investigators feel that these cases should not be placed in the respirator.
2. *Length of Time in the Respirator*—This is determined by watching the patient while receiving nursing care, especially when the respirator is opened. If no immediate respiratory discomfort develops, and if the patient is able to cough, he can gradually be weaned out of the respirator over a fairly short period of time. Emil Smith³³ states that the indication for removal from the respirator is the ability to cough, and not the ability to breathe freely and without effort.

3. *Disadvantages of the Respirator*

- A. The temperature is difficult to regulate.
 - B. The medical and nursing care cannot be conveniently administered.
 - C. The rubber collar is uncomfortable and irritating to the neck.
 - D. Orthopedic treatment cannot be carried out as desired.
4. *Pathologic Changes in the Lungs Due to the Respirator*—The following pathologic lung changes have been reported in the literature:
- A. Rupture of the alveoli due to emphysema.
 - B. Pulmonary atelectasis.
 - C. Pneumonia.
 - D. Pulmonary congestion.
 - E. Pneumothorax.

Summary

1. A review of the literature with an analysis of 68 cases of acute anterior poliomyelitis treated in the Min-

neapolis General Hospital, and of 6 respirator cases treated in the University of Minnesota Hospitals during the period from July 1, 1937, to December 31, 1937, is presented.

2. Sex distribution was equal in our series, but in collecting a larger series of cases in Minnesota extending over a number of years, the male incidence predominated over the female as indicated in the literature.

3. No evidence has been found to show any correlation between the blood groups and the incidence of poliomyelitis or the severity of paralysis.

4. Paralysis of the muscles of the trunk and abdomen was more frequent than one is expected to believe. It is often unsuspected. Careful muscle tests should therefore be done before discharge of the patient, in order to prevent subsequent deformities.

5. The leucocyte count showed no relation to the temperature, the average count being at the upper limit of normal. This suggests that the blood response and presumably the antibody response is slow or absent.

6. The majority of the spinal fluid cell counts were between 50 and 100. The spinal fluid cell count curve gradually fell until the onset of paralysis, when it rose again, then gradually fell. The polymorphonuclear count gradually decreased as the disease progressed, and the mononuclears correspondingly gradually rose until about the fourteenth day, when they reached practically 100 per cent.

7. The spinal fluid cell count was not a reliable guide to diagnosis. Repeated punctures have revealed that many cases with definite meningeal involvement clinically, or even with paralysis, may have normal cell counts which subsequently may or may not become elevated.

8. The course of the disease cannot be predicted by the temperature, spinal fluid findings, or the white blood cell count.

9. Convalescent human serum administered in the pre-paralytic stage was not effective in preventing paralysis. Neither did it cause any improvement in the paralytic cases so treated.

10. Normal adult serum in the form of whole blood transfusions was found to be more readily available, and just as effective as convalescent serum. Results tend to indicate that it is the treatment of choice at the present time, when the physician plans to use serum therapy. In the bulbar and bulbo-spinal cases, repeated whole blood transfusions have seemed to tide the patient over the critical stage of the disease.

11. Sulfanilamide administered in large doses to 17 patients was found to be of no help.

12. In Minnesota, where respirators are scarce, preference should be given to cases having intercostal or diaphragmatic paralysis in which this form of treatment is most effective. In bulbo-spinal cases with unilateral pharyngeal paralysis, the patient may be saved if the paralysis does not progress, but our experience with these cases has been discouraging. In pure bulbar cases, the respirator is not indicated and possibly is contraindicated.

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Field Clinics for Crippled Children in Minnesota

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FIELD CLINICS for indigent crippled children in Minnesota have proved to be one of the most valuable public health methods of preventing crippling conditions in the apparently normal child and preserving function and preventing further disability in the child already crippled. Because field clinics are held yearly by the Division of Services for Crippled Children of the Minnesota State Board of Control, throughout the state in rural communities in which general practitioners of medicine are located, it appears advisable to acquaint these men with the purposes, procedures and results of these clinics.

Funds that have been allotted to Minnesota by the Federal Children's Bureau under the Social Security Act have been used to extend and enlarge services for crippled children, particularly in rural areas suffering from severe economic distress. The extension of services has been directed in three fields of endeavor: first, increased hospital facilities; second, field nursing and physical therapy services; third, increased field clinics. In addition, social service has been made available at Gillette

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State Hospital, and one social worker has been employed to do the social service associated with the field clinics and the patients hospitalized in private hospitals. Because of the fact that there were crippled children on the waiting lists of the State Hospital, the University Hospital, and the Shriner's Hospital for Crippled Children, the first service rendered was the hospitalization of indigent crippled children in private hospitals in Minneapolis, St. Paul, Duluth and Rochester, the cities in which orthopedic surgeons are located. This service has continued uninterruptedly and has resulted in a marked reduction in the waiting lists and a decrease in the period of time new cases have had to wait for admission to hospitals for care.

The nursing service was organized in July, 1936, and became the connecting link between the local community and the official state agency. The nursing personnel is small, being composed of one nursing supervisor and six certified public health nurses, three of whom are also qualified physiotherapists. This staff works in close cooperation with the nurses under the supervision of the State Board of Health, acts as orthopedic nursing consultants to county, school, and other local nurses, helps

locate new cases, assists in the preparation for and the conduction of field clinics, and carries on a public health campaign of education directed toward the prevention of crippling conditions. When these nurses go into the local communities, their first duty is to contact the local physician, acquaint him with the services available for crippled children, make these facilities available to his indigent patients needing care, and investigate particular cases recommended for nursing service by the physician.

Since organization of this nursing service in July, 1936, approximately 1,000 physicians practicing in rural Minnesota have been interviewed by the nurses of the Division of Services for Crippled Children. This is one of the most important contributions that the field public health nurse, working with crippled children, has made in the field of public health during the year.

On January 1, 1938, there were in this state 8,306 known crippled children under 21 years of age on the register of the Division of Services for Crippled Children of the State Board of Control. The term "crippled children" includes mainly those cases with some deformity or disability of an orthopedic nature, but does not include children with eye or ear defects alone, or those with a mental deficiency only. On July 1, 1937, when the yearly analysis of cases was made, it was found that the 7,726 cases on the register, on whom complete data was available at that time, were distributed in percentages as follows, according to the cause of disabling conditions in order of highest frequency:

<i>Cause of Disability</i>	<i>Percentage</i>
Congenital deformities	23.14
Anterior poliomyelitis	16.37
Cerebral palsy	13.32
Miscellaneous	12.92
Not classified	10.16
Acquired or accidental	8.83
Osteomyelitis (acute and chronic)	4.08
Rickets	3.55
Bone and joint tuberculosis	2.69
Arthritis	2.15
Scoliosis	1.46
Muscular dystrophy	1.33
Total	100.00

Minnesota's population of 2,500,000 people is approximately 50 per cent rural, and of the total people in the state, approximately 1,000,000 are persons under 21 years of age. There are 87 counties in the state, which have an area of 84,682 square miles. These factors are mentioned because they are of importance in considering field services to be given over such a large area and to people in sparsely populated communities.

For several years, the staff of the Gillette State Hospital, in coöperation with the Minnesota Public Health Association, has held orthopedic clinics in certain rural areas for the purpose of giving a field clinic service and also in order to educate the public as to the need for care of crippled children. This coöperative enterprise was of real value, but could not be carried out in every part of the state, and a sufficient number of clinics could not be held year after year. No provision could be

made for field follow-up, nursing or physical therapy service, because of lack of funds, even though a request has been made frequently by the Gillette State Hospital for such services.

It is to be recalled that the Gillette State Hospital first started in 1897, and has been doing excellent work ever since then. At present, it is a hospital of 250 beds used solely for crippled children who are unable to have private medical care. The work that is being done by the Division of Services for Crippled Children is under the Board of Control, as is the Gillette State Hospital; the work which is described in this presentation, is simply a continuation and extension based upon the excellent foundation prepared by far-seeing medical men who have been associated with the State Hospital since the beginning of the twentieth century.

The purposes of field clinics for crippled children in Minnesota may be summarized under four main headings: first, finding new cases second, following up old cases; third, emphasizing preventive health education; and fourth, providing consultation services for the local family physician for his indigent crippled children patients, and opportunity for "refresher" observations of orthopedic diagnosis and recommended treatments afforded so ably by the orthopedic surgeons at the clinics.

From two special studies that have been made within the last year, concrete reasons for holding these field clinics become apparent. In the first study, among 227 male children crippled by anterior poliomyelitis who were admitted to the State Hospital, it was shown that 71.8 per cent did not enter the hospital until three or more years, and 38.3 per cent until five or more years after the initial attack. This means that if patients do not come to the family physician or to the hospital center soon enough, it is necessary to go out after them if crippling is to be held at a minimum. In the second study made at the State Hospital for Crippled Children among 1,070 patients registered at the hospital, it was shown that 140 patients who should have returned had been seen last ten to fifteen years previously, and that 215 additional patients who should have returned were not seen one to five years after the initial treatment. This means that 33 per cent of the patients who should have returned did not return for additional care.

The success of a field clinic is largely dependent upon the proper preliminary work performed by the field staff. One of the important parts of this preliminary work is the coöperation given by the local medical society. No clinic is held without the approval of the medical society of the county in which the clinic is to be held. From four to six weeks before the clinic, nurses go into the counties which are to contribute children to the clinic, contact the local physician, investigate all known crippled children and reported cases, and urge old cases who have not returned to the hospital for care, to come to the clinic for a check-up to see if something can be done. A local clinic committee is set up, and all local agencies interested in the care of children are invited to coöperate. These clinics are genuinely coöperative with local, county, and state groups participating. Two qualified orthopedic surgeons, a pediatrician, a physical therapist, local and

state public health nurses, medical social service workers, and a vocational rehabilitation expert from the Department of Education are in attendance at these clinics. The publicity used for the clinics is handled by the Minnesota Public Health Association.

Of paramount importance is the financial eligibility of patients coming to these clinics. Eligibility is determined by the social service worker of the Division of Services for Crippled Children who assists at the clinic. When patients are referred to these clinics by our field nurses and other public health nurses, the request is made to get a letter of referral for clinic examination from the family physician. This referral slip states whether or not the doctor wishes (1) to have the patient examined and referred back to the physician for treatment, or (2) to have the patient examined and treated at one of the state hospitals if the patient is unable to have private medical care provided. This letter from the physician is considered sufficient evidence to admit the child to the clinic for an examination. For those patients who do not present a letter from the family physician, a complete financial and social history is taken by the social service workers. This is passed upon by the director of the clinic before admittance is gained. At every clinic, there are certain people who attempt to obtain free service for their children just because a free clinic is being held in the town. These persons who are able to provide private medical care are refused admittance and told to go back to their family physicians.

The clinic medical service consists of a careful examination by an orthopedic surgeon. After examination has been made, the orthopedic surgeon dictates the results of his examination to a medical stenographer at the clinic, and makes recommendations as to future care. The orthopedic surgeon explains briefly what the cause of disability is and informs the parents that arrangements will be made through their family physician for future care when indicated. The results of the examination and recommendations of the orthopedic surgeon are then made up in report form, and these reports are sent to the family physician. At the same time, the parents are notified to go to their family physician for the report. If hospitalization, out-patient care, or nursing service is recommended, the Division of Services for Crippled Children makes these arrangements through the family physician and the family.

During the past year, many of the new cases were referred to the clinics by a letter from the family physician. In many instances, the family physician accompanied the patient to the clinic and was present during the examination of his own patient. Whenever it has been possible to continue the care and treatment locally, that recommendation has been made by the orthopedic surgeon. Many of the local physicians who have come to the clinics have remained during the entire day in order to benefit by the experience of observing the orthopedic surgeons at work making examinations and giving recommendations for individual cases. In this way, the clinics are serving actually as refresher courses for many of the local physicians throughout Minnesota.

In the calendar year 1936, there were eight clinics

held in rural areas in which 719 crippled persons under 21 years of age were examined. About 35 per cent of the cases were new to the state register, which meant they had not received treatment at any of the public hospitals or the Shriner's Hospital for Crippled Children, and had not received services from any state agency for their crippling conditions. For those children examined in the clinics held in 1936, hospitalization for surgical care was recommended in 20.3 per cent, out-patient department specialized care was recommended in 32.3 per cent, field nursing service was recommended in 16.8 per cent. The remainder of cases were (1) referred to institutions, (2) no care was necessary or (3) care could be given locally. This included such things as lifts, arches, or repairs on shoes, and general medical supervision. The summary of the 1936 clinics has been previously described in the *Physiotherapy Review*, Volume XVII, No. 1, 1937.

The field clinic program was set up on a state-wide basis for the first time in the calendar year 1937. During that year, 13 clinics were arranged at strategic points so that crippled children from every rural county had access to a field clinic. An average of 71 children were examined per clinic. Of the 928 children examined, 269, or 30 per cent, were cases new to the register. This is interesting in view of the fact that there were eight large clinics held last year and several clinics held in previous years. Very few of these cases were new cases which developed during the past year. It is reasonable to assume that they were cases which had been present but undiscovered until field clinics brought them to light. It is a remarkable fact that almost one out of every three cases seen in the clinics during 1937 was a case new to the state register.

The ages of children coming to these clinics is shown in Table I, in which the ages are grouped according to the United States census report classifications. Of the total cases seen in the clinics, 2.1 per cent were under one year of age; 15.7 per cent, one to four years of age; 22 per cent, five to nine years of age; and the remainder, from 10 to 20 years of age. In Table I, it is to be noted that 40 per cent of the crippled children were under 10 years of age and that 60 per cent were between 10 and 20 years of age. It is probable that we are still a long way from our goal of finding crippled children soon after the occurrence of their disabilities, when it is pointed out that 23 per cent of our cases are due to congenital deformities, 16 per cent due to infantile paralysis (most of which occurs under 10 years of age) and 13 per cent of our cases due to cerebral palsies, the majority of which are present at birth.

Further evidence of this is shown in Figure I in which the data from Table I is graphically shown. It is seen that among the new cases, 6.3 per cent were under one year of age, while in the old cases only 0.3 per cent, and that 23.8 per cent of the new cases were one to four, while only 12.4 per cent of the old cases were in that age group. There seems to be a definite shift to the younger age groups in the new cases which are now being seen in the clinics, when compared with the old cases who have received care before. It is true that the mere

TABLE I
CRIPPLED CHILDREN EXAMINED AT CLINIC
New and Old to State Register by Age Group
Minnesota, 1937

AGE GROUPS	NEW PATIENTS		OLD PATIENTS		TOTAL	
	No.	Per Cent	No.	Per Cent	No.	Per Cent
Under 1	17	6.3	2	0.3	19	2.1
1 to 4	64	23.8	82	12.4	146	15.7
5 to 9	71	26.4	133	20.2	204	22.0
10 to 14	63	23.4	211	32.0	274	29.5
15 to 19	47	17.5	210	31.9	257	27.7
20	7	2.6	21	3.2	28	3.0
Totals	269	100.0	659	100.0	928	100.0

TABLE II
CRIPPLED CHILDREN UNDER 21
By Cause of Disability, Recommendation at Clinic
Minnesota, 1937

Minnesota, 1957

CAUSE OF DISABILITY	CLINIC RECOMMENDATIONS											
	Hospital		OPD		Nursing Service		No Further Treatment		Other		Total	
	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.
Accidental or acquired	25	24.7	22	21.8	8	7.9	11	10.9	35	34.7	101	100.0
Anterior Poliomyelitis	69	35.0	79	40.1	9	4.6	11	5.6	29	14.7	197	100.0
Arthritis & Still's disease	6	30.0	9	45.0	0	0.0	4	20.0	1	5.0	20	100.0
Cerebral palsy	39	23.6	43	26.1	43	26.1	19	11.5	21	12.7	165	100.0
Congenital deformities	80	35.7	77	34.4	10	4.5	15	6.7	42	18.7	224	100.0
Muscular dystrophy	0	0.0	5	55.6	0	0.0	2	22.2	2	22.2	9	100.0
Osteomyelitis	5	15.6	12	37.5	1	3.1	5	15.6	9	28.2	32	100.0
Rickets	7	36.8	4	21.1	2	10.5	2	10.5	4	21.1	19	100.0
Scoliosis	9	42.8	6	28.6	3	14.3	1	4.8	2	9.5	21	100.0
TBC, Bone & Joint	2	16.7	6	50.0	0	0.0	0	0.0	4	33.3	12	100.0
Miscellaneous & Not Classified	30	23.4	19	14.8	12	9.4	12	9.4	55	43.0	128	100.0
TOTALS	272	29.3	282	30.4	88	9.5	82	8.8	204	22.0	928	100.0

fact that the cases are old would mean that they had been seen previously and, therefore, would be older than the new cases. However, when one considers the fact that many of these old cases have not been under supervision and have been rediscovered, so to speak, the comparison appears to be significant regarding the finding of younger children in the new cases coming to clinics.

The contents of Table II show the number of crippled children examined in field clinics in 1937 by cause of disability and recommendation at clinic. The table does not separate the newly reported and the old cases. It is interesting to note that 29 per cent of the cases seen had hospital treatment recommended, and that an additional 30 per cent needed specialized care in an orthopedic hospital out-patient department. There were 9.5 per cent of the cases for whom nursing service in the field was recommended, and approximately 9 per cent of the cases for whom no further treatment was necessary. The remainder, or 22 per cent, had some provision made for treatment locally, institutional care or general medical supervision.

Under the column in which hospitalization is recommended, it is to be noted that the percentage needing

hospitalization varies somewhat with the type of disability: for example, 35 per cent of the cases with anterior poliomyelitis, 35.7 per cent of the cases with congenital deformities and 15.6 per cent of the osteomyelitis cases are recommended for hospitalization; none of the patients with muscular dystrophy were hospitalized. Under the column headed "Nursing Service," the cerebral palsy cases have the highest number of recommendations made. The reason for this is the physiotherapy supervision and muscle education and training which is given in the home by certified public health nurses who are qualified physiotherapists.

After the field clinic for crippled children has been held in the rural community, and the children have been examined and have had recommendations made for the correction of their deformities, the real work of follow-up service begins. This must be continued over a long period of time and in the face of many obstacles by every branch of service of the Division of Services for Crippled Children, which includes the office force, the field nursing staff and the social service worker, in coöperation with every public and private agency interested in the care of children. The field clinic, then, is a means

unto an end. It is a means of finding handicapped children and sorting out those who are in need of special care; it must be followed by concentrated and persistent field service and adequate hospitalization in order to be of maximum value. This can be obtained only after the best possible physical restoration has been procured for each crippled child.

An inventory of all children seen in the six field clinics held in the fall of 1936 has just been completed, and some very important facts have appeared. An evaluation of the follow-up work following the clinics has been made and is shown in detail under headings listed below in the summary.

SUMMARY OF FOLLOW-UP AFTER CLINIC: FALL 1936

Number of clinics	6
Number of patients seen in clinics	719
Total number of patients studied	420
(Excluding patients previously under care at Gillette State Hospital)	

CLINIC RECOMMENDATIONS

Hospitalization	140
Out-Patient	31
Private care	36
Follow-up	163
No recommendations	50

Total 420

RESULTS OF RECOMMENDATIONS

I. Hospitalization	140
A. Patients Hospitalized—	
1. Private Hospitals (Div. Services C.C.)	38
2. Gillette State Hospital	29
3. Shriners Hospital	1
4. University Hospital	3
5. Private Funds (Children's Hosp.)	1
	72
B. Private care	17
C. Not Hospitalized—	
1. Opposed to surgery	13
2. Pending	32
3. Moved away	4
4. Died	2
	51
	140

It is to be pointed out that on all those cases hospitalized at private hospitals, one of our field nurses made a follow-up visit after the child had been discharged, to the home to see that the recommendations made at the time of discharge by the orthopedic surgeon were being carried out. For those clinic patients for whom out-patient hospital care was recommended, 7 patients appeared at one of the out-patient departments. Twenty-four did not for the following reasons: 4, private care; 1, over 21 years of age; 3, hospitalized by Gillette State Hospital; 1, not interested; and 15 on whom there is no information. In those cases where follow-up service was recommended by the orthopedic surgeon at the clinic, 127 patients were visited by the public health nurses, 54 of whom were given physiotherapy muscle training and muscle education in addition to the regular field nursing visits and supervision. Thus the field nurses will go into the homes of these hospitalized cases only on the recommendation of the orthopedic surgeon and with the approval of the family physician, who is given reports from time to time of the results of physiotherapy supervision.

A review of the inventory of the follow-up of the crippled children seen in the fall clinics of 1936 shows quite definitely that careful work is being done. It is almost unbelievable but true that some of the children's parents refuse to have care given even though facilities

are made available through the state service when private medical care cannot be afforded. One parent told a nurse that the child's affliction was an act of the Lord and, therefore, not to be interfered with. It is not always possible to find people home when the nursing visits are made, and, considering the large territory covered by each nurse, there is a certain delay in some cases. However, cases for whom immediate treatment is recommended or for whom there is any need for urgency in rendering service are taken care of immediately.

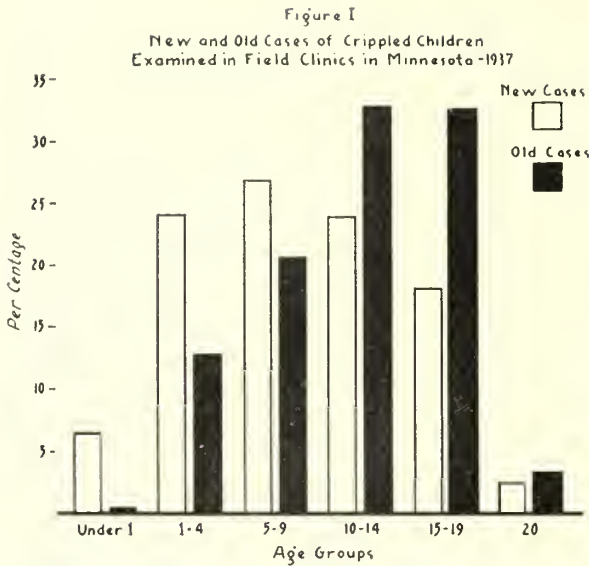
All new cases of acute anterior poliomyelitis reported to this division are turned over to Gillette Hospital, and the superintendent of Gillette Hospital will admit any new poliomyelitis case six weeks after the onset of the disease if hospital care is necessary; in the opinion of most orthopedic surgeons, hospital care is necessary in most of the new cases of acute anterior poliomyelitis in which there is evidence of paralysis.

In order to give the crippled or handicapped child his true bill of rights, we must afford him first, maximum correction of his anatomical deformity or defect; second, a common school education, if necessary, in special classes; third, vocational guidance and vocational training; and fourth, vocational placement, as recommended by the White House Conference on Child Health held in 1930. It is the first part of this program which medical men must concern themselves with primarily, and that can be effected only if indigent crippled children are located early, given proper medical and surgical treatment, and provided with proper medical supervision until their maximum physical rehabilitation has been obtained. After physical restoration, it is our duty and obligation to refer these children to the proper public and private agencies and organizations so that the other three parts of the program may be carried out.

In commenting on the benefit of field clinics for indigent crippled children in this state, it need only be pointed out that several hundred children otherwise unable to have private medical attention provided for them are receiving care which would have been delayed or not given at all, had not these field clinics been set in operation. The value of these clinics is further substantiated when it is reiterated that 30 per cent of the patients are new cases and of a younger age group than those to be found on the state register.

Over a third of a million dollars a year is spent in Minnesota for the hospital care of indigent crippled children. Certainly it is wise to insure this tremendous investment with a comparatively small expenditure for field clinics and nursing service for the purpose of follow-up of these cases to see that they continue on the road to recovery. These field clinics are really out-patient departments (of the crippled children's hospitals) located in rural communities where easy access to specialized service is possible and the greatest possible amount of follow-up is insured.

The preventive aspects of crippling conditions form a very big part of our present-day public health educational program. Field clinics are a very important weapon in the educational campaign to prevent permanent crippling conditions, particularly in children already



crippled. The clinic is a means of educating the people in the community, the local physicians, and public officials of the need for a concerted program for crippled children. Everyone knows how universal is the appeal of the crippled child, and when a community can be shown what can be done for crippled children, the impression is an indelible one and leads the way to improvements in general standards of public health in each community visited.

The highly specialized nature of orthopedic surgery makes the clinic for crippled children in a rural community quite different from a pre-natal, a pre-school, or a nutritional clinic. An orthopedic surgeon can examine a crippled child very quickly, determine what parts of the body are affected, and in the majority of cases, make an immediate tentative diagnosis and quite readily give recommendations for treatment. It is not necessary in this screening process to have elaborate laboratory tests made or to have X-rays for hidden disease in the chest and special examinations for obscure ailments in the abdomen. In our field clinics, all of the records from the State Hospital and the Division of Services for Crippled Children are brought into the community in which the clinic is being held so that an accurate follow-up examination and record can be made on children previously cared for.

Summarizing the functions and value of these clinics, it may be stated that it is possible to contact previously unknown crippled children for an adequate examination soon after the occurrence of their disability. In Minnesota, with its large rural area, many families living as far as 300 miles from an urban treatment center are unable to provide transportation to bring their children to the hospitals for crippled children for examination. This examination must be made before treatment can be decided upon. By sending the orthopedic surgeons out to the children in rural areas, much time is saved, the total cost is very much less, the examinations are made at an earlier date, and children who do not need hospital care can avoid the long trip down to the cities. Because the new cases are discovered soon after the

occurrence of disability, treatment can be started much earlier, with the result that these patients are given medical and surgical treatment in the shortest possible period of hospitalization.

Regarding the follow-up of cases who have had some hospital care and who need additional hospital care, it is true that many children will come to the hospital for one admission and not return for additional necessary corrective treatment, such as secondary operations, supervision in an out-patient department, readjustment of braces, or changing lifts on shoes. If adequate follow-up can be given these patients, the initial expert work done in the hospital for crippled children is of much more benefit than if the child discontinues treatment before his physical rehabilitation is as complete as possible.

The question is often asked, "Where does the family physician fit into this program?" The family physician is unquestionably the key person in any sound public health program for crippled children, and in this capacity, he renders a number of very definite services:

1. He usually sees the crippled child first and can thus help the child to secure the advantage of treatment soon after the disability occurs.
2. He is best situated to know of cases and can thus aid in locating crippled children.
3. He is often familiar with family circumstances.
4. He is well situated to be of definite aid in follow-up work.
5. He can be of great aid in returning the child to the hospital for subsequent treatment.

In return for these services, the family physician receives certain benefits:

1. An extension of his services for the indigent to include specialized orthopedic treatment.
2. Personal observation at clinics and consequent contact with orthopedic surgeons which act as refresher courses in crippling diseases.

This results in increased integration of the family physician in a program of public medical care for indigent crippled children.

The orthopedic surgeon works hand in hand with the family physician by carrying out special services for these crippled children who are made available to him, but he cannot be expected to do his part unless these crippled children are brought to him soon after the occurrence of their disabilities and continuously thereafter. Clinics for crippled children in rural areas are one of the means by which this can be done.

In conclusion, it may be stated that a review of the data presented on field clinics and an appreciation of the follow-up work that has been done following these clinics show quite definitely that these are one of the most effective methods of attacking the preventive, diagnostic and curative aspects of disabling diseases in children. The discovery of crippled children at an early age, soon after occurrence of disability, is logically followed by adequate and continuous special medical care and treatment which creates an excellent opportunity for maximum physical rehabilitation, at a minimum cost to the state and with a minimum amount of pain and suffering to the crippled child.

The Early Treatment of Chemical Burns of the Esophagus

(One Case Report of Advanced Stricture With Unusual Complications)

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CHEMICAL erosion of the esophagus belongs to the class of serious and painful diseases. The number of such cases is decreasing in this country, due to laws enacted in nearly every state, requiring a poison label to be placed on cans of lye and washing powder.

In the United States today, the common treatment of a patient who swallows some caustic poison is about as follows: his stomach is washed-out, the poison is neutralized if possible, and he is given a sedative or stimulant as needed. Fluids are given subcutaneously, and when there is no longer evidence of bloody secretion (about 4 to 5 weeks), stricture symptoms develop, and he is sent for treatment of the stricture. His esophagus has a lumen of from 2 to 3 mm., he is undernourished, exhausted, and the late treatment begins. Gastrostomy may be required, bougies are passed indefinitely or plastic surgery is attempted. The results are rather unsatisfactory.

The swallowing of various chemicals which may burn the esophagus is accidental in most cases I have seen. In Europe many more cases are observed in which the poison was swallowed with suicidal intent. Macmillan¹ reports 40 cases in the Massachusetts General Hospital, while numerous European authors report hundreds of cases. Boking reports 2,077 cases in 36 years at Stefanie-Kinderspital, in which 1,389 developed strictures of the esophagus.

The fact that this type of esophageal lesion occurs so much more frequently in Europe is the reason so many more articles appear in the foreign literature. Lotheifzen², in an article published in 1936, has a bibliography of 70 references, none to an American author. Salzer in 1920 reported the early treatment of 56 children resulting in 96 per cent cures. Others before him had tried the early treatment, but he is the one who should be credited with the proof of its efficacy. In spite of the wonderful results reported in such numbers, by so many men, over a period of 18 years, we in the United States are still more concerned with the treatment of strictures which could have been prevented had early treatment been used.

When a corrosive fluid is swallowed, the first thing to occur is necrosis of the mucous membrane. The mouth, tongue, palate, and pharynx may be burned and not much damage done to the esophagus, or the esophagus may be burned without any lesions occurring in the mouth. Hence, the appearance of the mouth is no guide to what is happening to the esophagus. All cases should be treated until such time as the esophagus can be safely examined. The depth of the necrosis de-

pends upon the concentration of the poison, and also upon the length of time it is in contact with the mucosa. The necrotic tissue sloughs off soon, and an ulcer develops, which has an inflammatory infiltration of its walls. Spasm occurs in an attempt to immobilize the ulcer and to diminish pain. This stage of acute stenosis is reached in from 3 to 5 days, while the resistance of the walls of the esophagus has not suffered. Now is the time to start treatment without fear of perforation. If treatment is neglected, the opposing granulations grow, and produce a fold-like stenosis, which will increase the danger of perforation.

The final stage is the replacement of the inflammatory infiltration by bands of scar tissue, resulting in stricture. Early treatment prevents this.

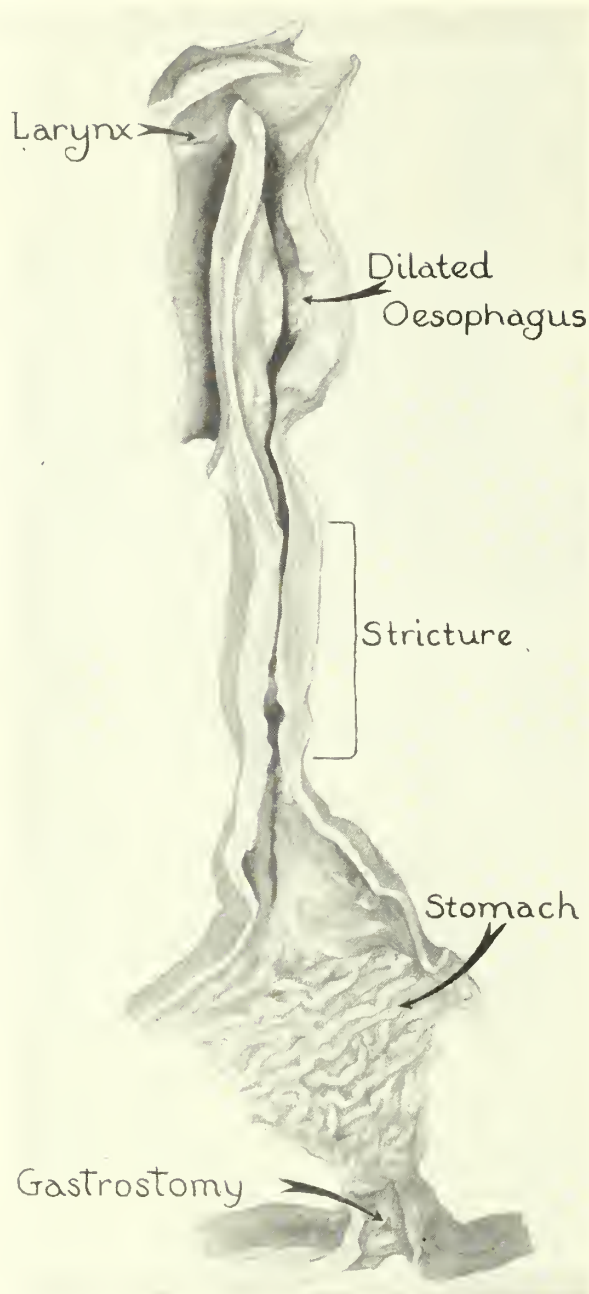
In the most severe cases the esophagus wall may melt away, and spontaneous perforation and death may result. If a bougie has been used, we should not blame it for the perforation, but rather, the severity of the burn.

Salzer's latest article³ reports 27 cases treated in three years, all healed without a stricture. The details of his technique are as follows: on the second day he passes an elastic esophageal bougie, filled with small lead shot, which has been placed in warm water, and he leaves it in place for a minute or two. On the third day he leaves it 5 minutes, the fourth day 10 minutes, and the fifth day 20 minutes and from then on 30 minutes a day. This 30 minute period should be all in one sitting, rather than twice for 15 minutes each. At times, he observes necrotic mucosa on the bougie, but has no fear of perforation. If he first sees a case as late as the sixth day, when ulceration and granulation are present, he fears perforation much more. Daily treatments are kept up for 4 weeks, and then every 2 days for a week, gradually reducing the frequency to once a week, then once every two weeks and once a month. The case is kept under treatment for 6 months.

In my own experience, since I have been using the early treatment, I have had no strictures develop. Unfortunately, I see more late cases than early ones. Here is the whole point—treat the case early and prevent stricture formation. We must educate ourselves and the public to realize that early treatment of the condition is essential.

I have found that it is not necessary to have the lead-filled bougie—any bougie or even a soft stomach or feeding tube will work as well. The early treatment is of more importance than the type of bougie used. I also like to inspect the esophagus by use of the esophago-

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scope, when such a procedure is safe, to get a better idea of how the lesion is progressing.

This paper does not deal with the late treatment of strictures; but I wish to report one such case with unusual complications.

Case Report: (See illustration).

Sara Derkson, admitted to the University Hospital 8-22-34, at the age of 21 months. History: Three weeks previously, swallowed lye solution. Milk was immediately

given followed by citric acid and olive oil. The child was unable to swallow for about 3 days, then could take liquids for about 2 weeks, when she was unable to take much of anything.

Examination: Showed healing burns in the mouth. It was impossible to pass the smallest feeding tube. A small filiform bougie was passed by esophagoscopy, and the child was able to swallow liquids. Larger bougies were passed and she was sent home at the end of one month, under the care of a local physician, who was to continue the dilations.

September, 1935; readmitted, hardly able to swallow liquids. Esophagoscopy showed a very tight stricture through which a very small bougie could be passed. It was impossible for the child to swallow a thread.

10-18-35: A gastrostomy was done. 11-10-35, retrograde dilations were started and repeated for a month, when a Number 22 could be passed. Frequently following each dilatation the temperature would rise to 101° and 104°. Child was able to swallow much better and was sent home until April 17, 1936. Gastrostomy was kept open and the child had been fed through the tube in the stomach. Retrograde dilatations were continued until December, when she was discharged once again.

Re-admitted 1-25-37, and retrograde dilatations were again started. In March, her temperature went up to 104°, twitching was noted on the left side of the face, followed by convulsions for the next few days, and then paralysis of the left side of the body. Papilledema began 3-5-37. Diagnosis of brain abscess was made 3-22-37. Right temporal decompression was done, but no abscess was found on puncture of the brain. Patient died, April 25, 1937.

Post Mortem: Large right temporal lobe abscess, probably originating in the mediastinum. No evidence of phlebitis, no abscess in the mediastinal glands.

I have found one similar case in the literature: Claus Vogel¹ reports a child developing streptococcic meningitis with multiple brain abscess.

Conclusions

Cases of chemical burns of the esophagus should be treated very early by the passage of a bougie or feeding tube.

If begun early and systematically carried out, a cure will result without the development of a stricture.

Most patients with this condition are seen by a physician at once. He should insist upon early treatment, for the danger of early bouginage is not nearly so great as the danger of neglecting it.

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The Feeding of the Child*

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ABOUT 150 years ago, a familiar appearing long-necked type of nursing bottle, provided with a sponge nipple rather than one made of rubber, was being used in Italy for the purpose of feeding milk to infants, whereas a pewter kettle, resembling a modern teapot, was being employed for this purpose in England. A piece of fine cloth, tied over small apertures in the tip of the spout of this kettle, served to strain the milk, and also to regulate its flow.

The obvious crudeness of these feeding devices was contemporary with relatively invisible defects in their contents, and its important influence on these invisible defects on the health and life of children I particularly desire to stress.

At the time these crude devices were in use, the universal presence of pathogenic bacteria was unknown, the scrupulous care that is required to prevent them from contaminating food was not appreciated, the rapidity with which bacteria multiply in foods, particularly in milk, was not suspected, and furthermore, the ease with which contaminating germs of disease may be killed and rendered harmless was not understood. These priceless bits of information came at a later date, and their life-saving effect is revealed when the mortality statistics of the past are compared with those of the present. In 1770, for example, approximately 49 per cent of the babies born in London died under the age of two years, and many of these deaths were the result of preventable gastro-intestinal infections caused by the consumption of contaminated food, particularly milk. The miserable condition existing at that time is partially revealed by the comments found in the medical literature of the period relative to the frequency with which the tolling of church bells announced the funerals of children.

The improvement that followed the birth of the science of bacteriology and the subsequent development and application of effective sanitary measures is illustrated by more recent records, such as those from New York City, which show that between 1898 and 1931, the infant mortality for the first year of life declined more than 60 per cent. A major share of the improvement in infant mortality revealed by this sample of the data recorded for this period was the result of the phenomenal decrease in fatal infections of the digestive tract.

These brief references to conditions prevalent in the comparatively recent past, and to the subsequent improvement which occurred demonstrate that the problem of feeding children is not limited merely to providing them with essential nutrients. In addition, they must be supplied with clean, wholesome food which does not contain harmful living bacteria or other injurious agents.

At the present time, children and also adults enjoy

the protection provided by numerous stringent sanitary measures, but instead of relying exclusively upon the diligence of food producers, food handlers, merchants and health officers, to preserve the health and life of children, careful mothers give their infants the additional protection the boiling of milk provides.

In general, it may be said that food serves two chief purposes. First, it sustains the chemical structure of the body, and second, it supplies needed energy. Owing to the ability of the body to obtain needed calories from fats, proteins, or carbohydrates, the sources from which energy is derived are interchangeable to a considerable degree. However, the materials required for the maintenance of the normal structure of the body are so individually indispensable that substitutions cannot be made. Consequently, failure to provide essential structural materials in adequate amounts frequently results in the production of frank pathologic states or diseases, many of which can be recognized as reflecting specific dietary deficiencies.

Apparently, the nutritional requirements of infants, children, and adults are qualitatively identical. In other words, the variety of indispensable structural materials needed by the human body does not vary with age. Owing, however, to the capacity exhibited by children to grow and to expend excessive amounts of energy, they require relatively more food than adults need. Consequently, definite quantitative variations in nutritional requirements characterize different age periods.

When the quantitative variations in nutritional requirements at different ages are measured in terms of energy, it is found that between infancy and puberty the average total daily caloric requirement rises from five to six hundred to three to four thousand calories, and then gradually declines to the adult level.* The energy utilized during childhood for sustaining basal metabolic processes and that used in supporting physical activity tend in general to increase with advancing age and growth. The expenditure of calories for the support of growth terminates, however, in the late 'teens.

Over-indulgence in calories leads to obesity, whereas subsistence on a grossly inadequate caloric intake leads to emaciation. These contrasting states of abnormal nutrition are quite common, thus occasion frequently arises for attempting to streamline excessively fat children and to round the undernourished ones. But since the caloric requirements of overnourished children are lower than their weights indicate, and since undernourished children need a relative abundance of calories, it is advisable to adjust the energy consumption of overfed and underfed patients on the basis of the expected normal weight for corresponding age and height rather than upon the actual weight. Lack of will power on the part of the patient explains many failures in attempts to correct obesity.

* One of a series of four public lectures sponsored by the Minnesota chapter of Sigma Xi dealing with the general subject: "Man and His Diet"; delivered on February 11, 1938.

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Consideration of the energy required per unit of body weight at different ages shows that during childhood the total number of calories needed daily per kilogram drops from a normal average of about 120 in early infancy to approximately 80 at six years of age.* This level is maintained for eight or ten years, after which a gradual decline to the adult value of 40 to 45 calories per kilogram occurs. Obviously, these changes in caloric requirement per unit of weight cannot be ignored when voluntary efforts are made to alter the child's state of nutrition. Furthermore, care must be exercised to provide an adequate supply of the essential materials, particularly where the correction of obesity is being attempted.

The amount of energy utilized for different specific purposes during childhood varies widely at different ages. In general the basal requirement per unit of weight rises during the first few months of life and then gradually declines to reach the adult level in the late teens, whereas the calories expended in physical activity increase until the period of puberty and then decrease. A very large expenditure of energy per unit of weight occurs particularly during infancy in supporting the extraordinary demand occasioned by the exceptionally rapid growth characteristic of this period.

The necessity, created by rapid growth and relatively high energy expenditure, for supplying infants with an exceptional abundance of nutrients, and the child's inability to tolerate and digest many of the foods commonly included in the diet of more mature individuals, are factors which combine to make the first few months one of the critical periods of life. The food provided by nature to supply the special requirements of this critical period is milk, and when human milk from healthy mothers is available in liberal amounts babies thrive on it. This is interpreted as acceptable evidence of its adequacy.

Chemical analysis of human milk shows that it contains sugar, fats, proteins, a long list of salts, an assortment of vitamins, a large amount of water, and various other identified and unidentified substances. Furthermore, its fats include a variety of fatty acids, two of which probably are essential for normal nutrition, and its proteins contain the ten amino-acids known to be essential for maintenance and growth and for the construction of tissues. The secret of the adequacy of breast milk as the sole food for the first few months or critical period of life doubtlessly lies, therefore, in the wide variety of substances which enter into its composition. Its composition also indicates what the mother's diet must include if depletion of her body is to be avoided during lactation.

The most commonly used substitute for human milk is cow's milk. Although these two foods contain comparable varieties of organic and inorganic substances and look somewhat alike, nevertheless, they are by no means identical foods. With respect to the partition of their solids, human milk is relatively richer than cow's milk in substances utilized mainly as sources of energy, but is poorer than cow's milk in materials which enter into

the construction of tissues. Whether these observed differences represent natural adaptations which correspond with differences in the respective nutritional requirements of children and calves is a question which invites speculation, but instead of indulging in speculations on this point I prefer merely to call attention to the observation that the death rate for breast-fed babies is distinctly lower than that recorded for artificially fed infants.

A more detailed comparison of these two foods shows that human milk is unique in its relatively high sugar content. Its total protein, however, is distinctly lower than that of cow's milk. This difference applies to casein rather than to lactalbumin, for the latter is more abundant in human than in cow's milk. Also with regard to their respective content of inorganic substances these foods are dissimilar. In general, cow's milk is relatively richer in these materials.

Since cow's milk and human milk are not chemically identical, the success that commonly attends the feeding of cow's milk to young infants reveals the possession by babies of a capacity to tolerate and to utilize a mixture whose composition departs far from that of their natural food, human milk. The limit of the young infant's ability to tolerate and to assimilate this alien food usually is not exceeded if water and sugar are added to cow's milk and the resultant mixture is boiled. This last procedure enhances the digestibility of the formula and also sterilizes it. The desirability of sterilizing cow's milk becomes obvious when we consider that this food is collected in barns.

Regardless of whether the baby is nursed or bottle-fed, it is common practice to start the administration of orange juice and cod liver oil in the first or second month of life. Although each of these foods contains a variety of substances, they are added to the diet mainly for the purpose of augmenting the consumption of vitamins C, A and D. The addition of orange juice to the diet is particularly indicated in instances where artificial feeding is necessary, owing to the fact that the aging and boiling of cow's milk are factors which tend to reduce its vitamin C content. The value of cod liver oil as an important source of iodine probably is not generally appreciated.

During the transition from a milk diet to one of more varied character, cereals, vegetables, fruits, eggs, and meats are gradually added, with the result that when the baby reaches its first birthday its diet includes a liberal variety of foodstuffs. Throughout the remaining years of life all of the essentials of nutrition probably can be obtained by daily subsistence chiefly on the specified foods shown in the following list.

1. $1\frac{1}{2}$ pints of milk.
2. 1 to 2 eggs.
3. Meat, fish, fowl, kidney, liver.
4. Two or more vegetables.
5. Orange or its equivalent.
6. Cooked fruit.
7. Cod liver oil.

The remainder of the diet may be selected according to taste, but these additions should not consistently replace the specified foods. The unspecified selections

* The caloric requirement for boys is higher than that for girls of corresponding age and size.

made according to taste will ordinarily include breads, cereals, potatoes, and desserts. Since I am discussing the feeding of children, I suspect I should also mention peanut butter sandwiches, hamburgers, hot dogs, popsicles, ice cream cones, and candy, in the optional list.

Refusal on the part of the child to eat a liberal variety of foods creates a very distressing problem the correction of which is difficult to accomplish. Relative to the solution of the difficulty, I venture the suggestion that children living in homes where care is exercised to provide an abundance of the foods included in the specified list, will tend in general to become more accustomed to eating a varied diet than other children who live in homes which provide a relative abundance of the optional foods. Consequently, parents may avoid converting the family table into a daily battle ground by placing proper orders with the grocer and butcher.

Concealed in the commonplace foods included particularly in the specified list are numerous individually indispensable nutritional factors. Scientific investigations have resulted in the identification and isolation of several of these essentials, and to some of the investigators who accomplished these discoveries the Nobel prize has been awarded. But, in spite of the splendid studies that have been made, many unidentified essentials of nutrition doubtlessly remain hidden in the foods we consume and await future discovery.

The most abundant single substance present in the diet outlined in this paper is water. The importance of this well-known ingredient of the diet becomes apparent when we consider that life does not exist in the absence of water. The water we carelessly drink and consume with food automatically distributes itself into separate compartments of the body. About 70 per cent of the retained water is confined within the cells of the tissues and the remaining 30 per cent is extracellular in position. Of the latter, approximately four-fifths occupies the interstitial spaces between the cells, and the remaining one-fifth circulates in the vascular system.

Deprivation of water leads first to a depletion of the interstitial fluid, and when this relatively elastic reserve supply approaches exhaustion, the volume of the blood plasma falls and its viscosity increases. Continuance of the process of dehydration occasions the loss of excessive amounts of intracellular fluid.

Severe loss of body water combined with general starvation produce an extremely emaciated body clothed in an apparent excess of loose wrinkled skin which is thrown into coarse inelastic folds. In the absence of serious complications, a rather prompt recuperation usually follows the liberal administration of suitable fluids and nourishment.

During dehydration important salts escape from the body, and under certain circumstances this process of demineralization may be complicated by a derangement of the normal acid-base equilibrium of severely depleted body fluids owing to a loss of a significant excess either of base or of acid ions. The seriousness of alterations in the electrolyte balance of the fluid matrix of the body is dependent upon the fact that changes of this character seriously derange the numerous interrelated chemical

reactions which collectively comprise metabolism. Recognition and correction of grave complications of this character require examination of the electrolyte structure, particularly of the dehydrated patient's blood plasma, the fluid portion of the blood.

With respect to its electrolyte structure, normal blood plasma is a dilute solution of almost equally balanced base and acid ions. Its electrolyte structure resembles that of sea water, and is also remarkably similar to that of the interstitial fluid. Common table salt, or sodium chloride, is the chief inorganic salt present in each of these three fluids. In a sense, therefore, a small sample of modified sea water, trapped in the body, bathes the cells of the tissues. Like other body fluids, the blood plasma contains a weakly alkaline buffer substance, the bicarbonate of the blood, which by increasing or decreasing serves to prevent variations in the ratio of strongly basic ions to strongly acid ions from producing incompatible alterations in the normal slight alkalinity of this fluid.

During the course of severe and protracted vomiting, the body loses a relatively large amount of hydrochloric acid. This removal of an excess of strong acid ions is associated with a compensatory increase in the bicarbonate of the blood plasma. The clinical condition associated with a change of this character is known as alkalosis.

If, however, the depletion of body fluids is the result of profuse diarrhea a large amount of fixed base, which predominates over acid in the intestinal discharges, is lost. The effect of this excretion of a significant excess of fixed base on the bicarbonate of the blood plasma is just the opposite of that produced by a depletion of chloride or strong acid ions. Under these circumstances the bicarbonate decreases. This type of change in the electrolyte structure of the blood plasma is spoken of clinically as the condition of acidosis.

The gravity of a derangement of the electrolyte balance of the fluid matrix of emaciated and dehydrated patients is illustrated by the alarming symptoms they manifest. Under these circumstances the dry inelastic skin becomes ashy-grey in color, the concentrated blood makes the lips appear a brilliant red, the pulse becomes weak and thready, breathing is shallow and irregular or deep and pauseless, the kidneys cease to function, stupor deepens into coma, convulsions may intervene, and the lusterless, glazed eyes sink into their sockets.

This picture illustrates the necessity of supplying the body with adequate amounts of water and of various salts, particularly ordinary table salt. The nutritional importance of these commonplace substances doubtlessly is on a par with that of vitamins or other indispensable nutrients.

A significant derangement of the normal acid-base equilibrium of the fluid matrix of the body is far too serious a condition to permit self-medication with proprietary preparations whose capacity to correct an acid or an alkaline state, or to rid the body of acids or alkalies is highly praised and widely advertised. The preparations used by physicians to correct alkalosis or acidosis include Ringer-Tyrode's solution, physiological salt solu-

tion, Hartman's solution and glucose solution. Instead of discussing the special indications for preference in the use of each of these repair solutions, I prefer merely to call attention to the fact that not one of these therapeutic agents is advertised to the public.

The consumption by children of diets deficient in available calcium, or their failure for various reasons to retain a normal amount of this mineral, leads to a gradual decline in the quantity of this substance in the blood. A slightly subnormal blood calcium level is associated with symptoms such as nervousness, irritability, and restlessness during sleep. A more marked decline in the blood calcium produces the clinical condition known as tetany, which in florid cases is characterized by protracted spasmodic contractions of the hands and feet as well as by severe generalized convulsions. The specific relationship between calcium deficiency and tetany is dramatically revealed by the prompt curative effect particularly of calcium chloride. Through the interaction of the calcium contained in different foods, particularly milk, and the vitamin D obtained either through the effect of sunlight on the skin or by the consumption of cod liver oil, the occurrence of the convulsive state known as tetany usually is prevented.

In young infants the hemoglobin normally is relatively high, but during infancy it tends to fall. Protracted subsistence on a diet deficient in iron augments this tendency, and frequently results in the development of varying degrees of nutritional anemia. The administration of iron serves to correct this condition, but a more favorable response usually is obtained when copper is given in addition to iron. The inclusion in the diet of meats, particularly liver and kidney, as well as eggs, sea foods and various vegetables and fruits probably can be relied upon to provide the iron and copper required for the synthesis of a normal amount of hemoglobin.

The importance of including iodine in the diet is revealed by the special effect of this mineral on the thyroid gland. A dietary deficiency of this mineral is prone to cause the development of a special benign type of goiter. This type of goiter is so prevalent in some regions, such as that bordering upon the Great Lakes, it becomes a public health problem. Various schemes have been devised to solve this problem, important among which is the policy of adding a small amount of iodine to common table salt. The adoption of a method of this character for guaranteeing sufficient dietary iodine to prevent goiter seems necessary owing to the fact that the iodine content of vegetables and fruits varies greatly depending on where they are grown.

In addition to supplying the amino-acids needed for the construction of tissues, the protein of the diet also serves to maintain the plasma protein at a necessary level.

The rôle the small amount of protein present in plasma plays, through the colloidal osmotic pressure it exerts, in contributing to the maintenance of normal volumetric relationships between the intravascular and interstitial fluids is revealed when the plasma protein is considerably reduced.

Protracted subsistence on a diet extremely low in protein reduces the plasma protein. The accompanying fall

in colloidal osmotic pressure permits fluid to escape from the vascular system and collect in the interstitial spaces. In this manner, edema or dropsy of nutritional origin may develop. A similar water-logging of the tissues occurs when the blood proteins are depleted as a result of the excretion, in nephritis or nephrosis, of urine containing a large amount of albumin.

In association with diets deficient in proteins of animal origin, and in vegetables, a peculiar disease may develop which is known by the name, pellagra, given to it by Italian peasants many years ago.

The strikingly characteristic manifestation of this disease is the appearance of symmetrically-distributed skin eruptions particularly involving exposed areas. Exposure to sunlight is prone to initiate the development of these lesions, and advantage may be taken of this fact when the diagnosis of the disease is in question. At first the lesions resemble sun burns, but later they assume a brownish discoloration. Subsequently, the involved areas desquamate and leave a smooth, velvety-appearing surface.

The manifestations of pellagra are by no means limited to changes in the skin, for in addition pellagrous patients may also exhibit symptoms which reveal involvement of the digestive tract and of the nervous system.

For a long time, pellagra was attributed to eating spoiled corn and consequently it was frequently spoken of as "maize disease". The possibility, however, of determining the exact etiology of pellagra followed the observation that diets similar to those associated with the development of human pellagra produce the condition known as black tongue in dogs. Analysis and comparisons of these diets with those which prevent pellagra and black tongue, recently resulted in the discovery that nicotinic acid is an effective agent in preventing and curing black tongue in dogs and pellagra in man. This observation provides significant evidence that nicotinic acid is the vitamin concerned in pellagra. Apparently, this substance is a part of the naturally occurring vitamin B₂ complex. Good sources of the pellagra-preventing factor include lean beef, liver, fish, eggs and yeast.

A deficiency of vitamin D, due either to a dietary inadequacy, or to a failure of ultra-violet rays of the sun to activate ergosterol of the skin, results in the development of rickets.

The conspicuous deformities of the extremities caused by this disease, are well-known and probably need not be dwelt upon. Previous to the appearance of gross deformities of this character, X-ray examination of the bones may reveal the presence of rachitic changes such as rarefaction or poor calcification of bones, as well as a slightly concave irregularity and enlargement of the end of the shaft of bones.

Microscopic examination of these bones reveals interesting and complicated changes. Normally, the cartilage cells capping the extremity of a growing bone are arranged in regular columns parallel to the long axis of the bone, and a uniform horizontal zone of calcified-matrix marks the juncture of the cartilage with the sub-jacent newly-formed bone. Furthermore, the fine capillaries beneath this calcified zone have an orderly arrange-

ment, similar to that of the cartilage cells toward which they are budding.

In rickets, the uniform transverse zone of calcified matrix disappears, the cartilage cells lose their orderly arrangement and assume the form of irregular finger-like projections. Furthermore, the capillaries budding toward the cartilage cells lose their orderly arrangement.

Following exposure of the skin to ultra-violet rays or the administration of cod liver oil, the transverse zone of calcified matrix reappears and the remaining details of the histologic structure of the bone are gradually restored to normal.

Rickets is the result of a disturbance of the intermediate metabolism of phosphorus and calcium occasioned by a deficiency of vitamin D. The natural distribution of this vitamin is so restricted it is found in very few foods in quantities sufficient to be of special therapeutic value. The advisability, therefore, of exercising the precaution, particularly during the winter months, of providing children with a special supply of vitamin D in the form of cod liver oil or appropriate concentrates is apparent.

Our present knowledge of vitamins dates from 1911, when Funk discovered a peculiar disease, common in the orient and known as beriberi, to be the result of a dietary deficiency of a previously unknown substance. In connection with this discovery, he coined a new word, "vitamin", which like a historic shot, was soon heard around the world.

Beriberi is characterized in adults by the development of paralysis. During infancy and childhood, however, it is prone to feature a marked enlargement of the heart, and fatal cases usually are the result of cardiac failure. The cardiac enlargement seen in beriberi and the return of the heart to normal size following the administration of the antineuritic vitamin B₁ are easily demonstrated by serial X-ray examinations. The antineuritic vitamin B₁ is quite widely distributed in natural foods; thus subsistence on a varied diet effectively prevents the occurrence of beriberi.

Subsistence on a diet deficient in vitamin A or its precursor, a group of yellowish vegetable pigments, the carotenes, leads to the development of a peculiar thickening of the cells lining various moist parts and organs of the body. A severe depletion of vitamin A produces the clinical condition known as xerophthalmia. This disease is characterized by the appearance of thickenings of the epithelium covering the cornea or transparent part of the eye. These corneal lesions are prone to become infected with the result that opaque scars are produced which cause permanent blindness. Xerophthalmia is quite rare in America, but recent studies have revealed an unsuspected high prevalence of slight vitamin A deficiency. The discovery of slight degrees of vitamin A deficiency requires special tests of vision.

Under the influence of light, the visual purple of the cones of the retina of the eye normally bleaches and when it becomes colorless it has been converted into vitamin A. This vitamin regenerates visual purple, but the restoration is not 100 per cent. Consequently in the

absence of a reserve supply of vitamin A, a subnormal amount of visual purple is produced. Under these circumstances a definitely delayed ability to see distinctly in dim light results. This condition is known as night blindness.

The prevention of night blindness, and of the numerous other pathologic changes which culminate in severe instances in xerophthalmia, is contingent upon the inclusion of an adequate amount of vitamin A, or its precursor carotene, particularly beta-carotene, in the diet. This vitamin and its precursor are widely distributed in nature, particularly in fish liver oil, milk, butter, eggs, certain fruits and vegetables.

A deficiency of vitamin C decreases the strength of the cement substance which normally unites the cells covering moist surfaces of the body. Changes of this character may weaken the inner lining of blood vessels to the extent that severe hemorrhages occur, and it is the manifestations of hemorrhage which facilitate the diagnosis of examples of frank scurvy. Severe cases of scurvy are quite rare in America. Latent forms of the disease are very difficult to recognize, thus no accurate estimate of the prevalence of slight vitamin C deficiency can be made. Good natural sources of this vitamin include nearly all fresh fruits and vegetables.

During recent years, increasing use has been made of special diets as an adjunct to the treatment of diseases. The manner in which the diet may be advantageously modified to meet special indications probably can be illustrated by briefly discussing the dietetic treatment of eczema, epilepsy and coeliac disease.

For a long time, a causal relationship between fats and eczema has been suspected, and this suspicion led to the practice of feeding low-fat diets to eczematous patients. Splendid fundamental studies, conducted by Dr. Arild E. Hansen, associate professor of pediatrics in the University of Minnesota, resulted in the observation that the unsaturated fatty acids of the blood were sub-normal in some types of infantile eczema. Restoration of these fatty acids to normal levels, accomplished by feeding oils rich in unsaturated fatty acids, was also shown to be accompanied by a gradual return of the skin to normal. These studies have revealed a previously unsuspected rôle that the unsaturated fatty acids in the diet play in preserving the normal condition of the skin.

In the past, the treatment of epilepsy was almost exclusively confined to the administration of sedative drugs, and to the provision of favorable environmental conditions; but recently the dietary therapy of the disease has assumed a position of major importance. Various studies, particularly those of Dr. Irvine McQuarrie, professor and chief of the department of pediatrics at the University of Minnesota, have made water restriction diets, acid ash diets, and ketogenic diets, the foundation of the treatment of epilepsy.

A very peculiar type of diet is necessarily resorted to in the treatment of children who are unable to digest and tolerate fats and starches. In this condition, which is known as coeliac disease, or chronic intestinal indigestion, the restricted variety of foods the patient can tol-

erate usually includes buttermilk, cottage cheese, banana, egg white and cod liver oil. This protracted nutritional disorder reduces the body to a miserable state.

In this brief discussion of the feeding of the child, it has been possible merely to outline some of the disastrous effects of subsistence on diets deficient in different essentials of nutrition. If we now contrast the picture of robust health a complete diet can produce with the

convulsive state of calcium deficiency, with the miserable acidotic, starved condition that deprivation of water and salt produces, with the deformed extremities, the heart disease, the hideous skin eruption, and the hemorrhages and blindness that vitamin deficiencies cause, there seems to be no escape from the conclusion that the preservation of health and life are largely contingent upon electing to eat a liberal variety of wholesome foods.

Interesting Pediatric Cases Seen in Rural Practice

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ONE OF the most common symptoms in the diseases of childhood is vomiting. The baby does it normally when overfed. The older child vomits to throw out undesirable ingested material. But behind any vomiting there may be a pathological reason which we do not suspect at first. It is with this thought in mind that we present the following cases, each with a common symptom but each unusual and different.

Case 1. Baby W. was born November 9, 1937. Delivery was normal, with presentation O.L.A. No visible abnormalities were noted in the baby. On the third day post-partum the infant began to vomit. One of the first things noticed by the mother was that the baby threw up his entire feeding. The vomiting was effortless and occurred at varying intervals after ingestion of food. At times when there had been several feedings before emesis, the amount lost would be correspondingly larger.

To rule out pylorospasm, which is responsible for most of the obstructive vomiting of infancy, atropine sulphate in solution of 1 to 1,000 was given before each feeding. Dosage was one drop in a little water, being increased by one drop at each dose until tolerance was reached or until vomiting stopped. Feeding of thick cereal was also instituted, but the vomiting was unaffected.

By the seventh day bile appeared in the vomitus, a sign which together with the early inception of the vomiting, would tend to rule out spasm or stenosis, and would point to an obstructive condition at or below the duodenum. Meanwhile the weight had dropped and the skin turgor had diminished. The vomiting continued. X-rays of the stomach showed no passage of barium beyond the duodenum. The baby presented the appearance of an undernourished, active, extremely hungry infant. There was a fever of 101° rectal, due to inanition.

After a pre-operative preparation with subcutaneous fluids, a laparotomy was done on November 18, 1937. The findings were transduodenal bands compressing the duodenum. The stomach was gas filled and when the bands were freed, air escaped and filled the lower intestinal tract.

Postoperative care was complicated by further vomiting of bile and gastric contents. For two weeks feed-

ings were given *via* nasal catheter with emptying of the stomach before feedings. On December 11, 1937, the baby was sent home from the hospital. His weight was 8 pounds, 7¾ ounces. He was able to take his food by mouth and tubing was unnecessary. In two weeks he had gained one pound and at the present time he is still gaining.

The occurrence of congenital duodenal obstruction is quite rare, and differentiation from pylorospasm is generally easy. Congenital atresia of the duodenum can be differentiated from adhesive bands only by operation.

Case 2. Another case presenting vomiting as a major symptom was brought to our attention on March 7, 1931. D. K., a boy of eight years, had been vomiting large quantities of undigested food. Vomiting occurred usually long after his evening meal. Often he would vomit in the morning what he had eaten the night before. There was no marked pain.

Physical examination showed little except a mild degree of undernutrition. In the sitting position the chest seemed normal to the usual methods of examination. The abdomen was flat, showed no tumors by palpation, and there was no tenderness. Because of the scarcity of physical signs, a barium meal was given. Pictures taken in the prone position showed a distorted stomach shadow, with a gas bubble partly filled with barium in the right chest cavity. When the table was tilted, gravity worked to spill barium into the portion beyond the diaphragm. A diagnosis of herniation of the stomach through the right side of the diaphragm was made.

Treatment consisted of giving the boy his main meal at noon, a light supper at four o'clock and no food after this time. He was allowed to remain up longer than usual, because as long as he remained in the upright position, his stomach could empty normally. This was shown by X-rays taken six hours after a barium meal and after he had played in his usual manner.

Relief from his vomiting followed this procedure and for several years he was fairly comfortable. However, X-rays taken in 1934 showed a greater degree of herniation and a much larger portion of the stomach occupying the right chest. The lower part of the right chest cavity was taken up by the stomach. In that year, a

repair of the diaphragmatic defect was made at the Mayo Clinic. The recovery was complete and to date there has been no recurrence of symptoms.

Aunsperger states that diaphragmatic hernia had been recognized during life in only ten instances previously to 1908. The case above is interesting in that after X-rays had been made, auscultation of the chest revealed gurgling sounds when the patient was on his back and pressure was applied to the epigastrium. This finding should be useful where X-rays are not immediately available. The incidence of diaphragmatic hernia is said to be about forty-two in 3,500 cases with gastric symptoms.

Case 3. A third case presenting vomiting with pain occurred in our practice September, 1931. The girl, L. N., age seven, had begun with pain over the entire abdomen. Vomiting began on the night of September 17th. The temperature was 101° and the pulse 100. There was no muscle spasm or distention. Pains were intermittent at about one-hour intervals. Because of the type of vomiting, she was hospitalized with a tentative diagnosis of intestinal obstruction. Her temperature

dropped to normal and the leukocyte count was 7,000. Relief followed an enema and until the next day, she was fairly comfortable. At this time, peritoneal irritation was noted and a tender mass was felt in the lower right quadrant.

Her history revealed that during the past year her appetite had been poor and she had had spells of nausea and abdominal pain. Spells of vomiting came on suddenly at night. At operation, a mass was found in the jejunum, with a dilated bowel. Peritonitis was present. A hair ball was removed and an enterectomy performed. She died two days postoperatively.

It was found later that for two years the child had been in the habit of pulling hairs from her head and chewing them. The habit had progressed until she had a bald spot on the side of her head. She had always been nervous.

These cases, while not startling in the practice of medicine, do illustrate what can come into the hands of rural practitioners who see children. We cannot forget the unusual in dealing with the common symptoms.

Prostatitis*

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THE FREQUENT occurrence of prostatitis in some form as a disease entity, responsible for the multiplicity of obscure symptoms which confront the physician, has been discussed frequently in modern medical literature; and yet how often a good rectal examination as part of the routine physical examination has been neglected. There have been many attempts to ascertain the percentage of our male population who have or have had gonorrhea during their life time. These estimates have run from 60 per cent to 85 per cent of all men above the age of 18 years. Gonorrhea has been stated to be the most prevalent of all diseases except measles. Regardless of these statements, one knows that a very high percentage of men have suffered this infection and are victims of its chronic sequelae. Prostatitis is the most common of all urogenital infections and gonorrhea is responsible for this condition to the greatest degree. Prostatic disease should be given major importance with any history of venereal disease. There are, however, on the other hand, a great number of men who have no history of gonorrhea, and due to this fact, the examiner has failed to do a rectal examination. One author has stated that if he were allowed only one procedure in examination of the patient, he would choose rectal examination.

Man was equipped with a complex pelvic musculature which served the purpose of anatomical massage for the prostate gland as he went about over rugged terrain in the quest of food, clothing, and shelter. With the advent of civilization he fell into a more sedentary life

and lost this physical activity. Further than this, with the concentration of population, which came in due course, he fell victim to disease that weakened his general structure. These two factors together brought about systemic infections and resultant focal infections. Chronic non-specific prostatitis is more common in the sedentary occupations, and with only few manifestations it is more common than one would ordinarily believe. The business executive, the office man, the adult student, the traveling salesman, and the chauffeur who rides constantly, fall within this group. Golf, as a pastime, perhaps has done more good in this respect as a corrective measure than any one other thing. These victims have gone on from year to year, doctor to doctor, with the removal of teeth and tonsils, or sinus operations, receiving no relief from their symptoms. This resulted in a great class of invalids who add nothing of happiness to society.

I wish to review the classification and symptoms and summarize the treatment carried out in my office, which has been very satisfactory in helping these cases:

Symptoms

Acute Prostatitis:

A. Pain:

Generally speaking, this is the most common symptom in prostatitis, but is most severe in this type. It is usually localized in the perineum and rectum. There may be occlusion of the prostatic ducts and abscess formation. Pain is frequent about the bladder neck and referred

* Read before the Blue Earth County Medical Society at February meeting, 1937.

along the urethra, causing painful exaggerated erections. Pain is usually referred to the scrotum or along the groin.

B. Dysuria:

As the prostate and prostatic urethra become inflamed and congested, urination becomes more difficult and partial or complete retentions are not uncommon. Residual urines may lead to pyelitis and pyelonephritis and eventually uremic intoxication.

C. Fever:

This is common in the acute type with chills and fever resulting in mental confusions.

D. Discharge:

Urethral discharge in large amounts is practically always present.

Chronic Prostatitis:

A. Pain:

In this type, as well, pain is the predominant symptom. It is not characteristically localized as in the acute form. It is by far more frequently of the referred nature and most common in the lower lumbar region, extending over the gluteal muscles and down the thighs simulating sciatica. This pain, to the patient, has been designated as "kidney trouble", "lumbago", or associated with physical exertion the commonly called "sacroiliac strain". Many insurance companies have recognized this latter condition and have demanded thorough histories and special examinations of the prostatic condition in all cases of lower back disabilities of prolonged nature. Pain in chronic prostatitis is referred less commonly to the perineum, rectum, bladder neck, and urethra. The distinctive character of the complaint is that pain is always worse in the morning and wears away with the day's activities. The chronic prostate infection may be the focus of infection resulting in pains elsewhere in the body. Most commonly these are knees, ankles, shoulders, and cervical spine. Initial flare-ups in these regions at the beginning of treatment have brought about this conclusion.

B. Dysuria:

This is not a common complaint, except when there is sufficient local disturbance to cause trigonitis and bladder neck irritation.

C. Discharge:

Discharge may or may not be present and most frequently is not a symptom, except in the more severe cases where there will be a "watery turbid", or even milky discharge experienced at the time of bowel evacuations, or in the final act of micturition when the spasmodic sphincter will force the prostatic secretion into the urethra. There may be

the characteristic "gluing" of the meatus or the occasional morning drop. Most frequently the patient is unconscious of this discharge until the process is of long standing.

D. Fever:

Fever is seldom if ever seen in this type of prostatic disease.

E. Sexual disturbances:

Sexual disturbances may or may not be present. Many of the cases with extensive infections show no sexual disturbances. Chronic prostatitis brings in the psychic elements and neurotic tendencies often develop. Most common of the sexual symptoms are painful erection, painful ejaculation, premature ejaculation, and apparent total impotency. Encouragement on the part of the physician when these conditions occur, together with general tonics and exercise, aid in their correction.

Classifications

1. Acute specific prostatitis.
 - A. Urethral discharge, thick and purulent.
 - B. Stains show positive for gonorrhea.
 - C. Urgency and frequency of urination.
 - D. Dysuria and painful erection.
 - E. Perineal pain.
 - F. Balanitis.
 - G. Hematuria due to congested prostatic urethra.
 - H. Any variations of these symptoms according to the severity of the infection.
 - I. Greatest percentage become chronic.
2. Chronic Specific Prostatitis.
 - A. History of acute attack.
 - B. Morning drop.
 - C. Stricture or other obstructive symptoms.
 - D. Urinary pain associated with trigonitis.
 - E. Discharge watery and turbid (gleet).
 - F. Prostatic shreds of "comma" variety which are undoubtedly prostatic casts.
 - G. Shreds seen in third urine.
 - H. Prostatic smears show either typical gonorrheal diplococcus or one of the degenerated forms.
 - I. Frequently associated with acute vesiculitis.
 - J. Rectal examination shows swelling and tenderness of prostate gland.
3. Acute non-specific prostatitis.
 - A. Profuse urethral discharge (treated as gonorrhea when bacteriology is not done).
 - B. Perineal pain.
 - C. Frequency and urgency of urination.
 - D. Burning with urination.
 - E. Lower abdominal pain.
 - F. Testicular pain.
4. Chronic non-specific prostatitis.
 - A. History of symptoms three months to many years.



Fig. 1. Proper Position for Examination.

- B. Watery turbid discharge (prostatorrhea) or history of gluing of meatus.
- C. Absence of history of venereal infection.
- D. Absence of gram-negative diplococci in prostatic smears.
- E. Presence of pathology of prostate on rectal examination with tenderness varying according to the severity of the infection.
- F. Pain, especially marked in lower lumbar region, perineal region, supra-pubic region, hips, thighs, median buttocks, and legs.

Diagnosis

This is obtained only through a careful history, together with rectal examination and laboratory findings. Examination of the prostate may be accomplished with little discomfort. One is usually dealing with a nervous, sensitive patient and rectal examination in itself is difficult for the ordinary patient. Complete relaxation of the patient during examination is most essential. This is best accomplished by having the patient lie in a recumbent position with the chest and abdomen resting on the examining table. He is then asked to reach back and grasp the gluteal muscles on either side and pull laterally. This serves the purpose of exposing the rectum, especially in the obese patient, as well as to partially dilate the external sphincter. The lubricated examining finger is then gently and easily inserted by asking the patient to "bear down" on the finger tip. The finger is then inserted upward to the superior prostatic margin and from side to side, noting the general contour of the gland. Size, tenderness, boggiess, and any nodular condition is then noted. According to the involvement, the gland in both acute and chronic disease is usually smoothly enlarged and tense with tenderness of some degree. In the presence of abscess, fluctuation may be felt. The distance from the anus to the upper margin gives one a definite impression as to the increase in size. The finger is then passed from side to side noting any

adhesions in the peri-prostatic tissues. The seminal vesicles are next examined, noticing swelling, tenderness, and compressibility. One of the best landmarks in the mild or moderate degrees of distention in the vesicles is the obliteration of the notch between the upper margin of the prostate and the vesicle. The finger is again returned to the prostate and extended laterally to each lobe. Beginning at the outer margin, firm pressure is exerted either by stripping or, in cases where the gland is very tender, by rotating the finger toward the median furrow. This is repeated several times over each lobe and expresses the prostatic contents into the posterior urethra. One notes the condition of the median furrow by stripping the contents downward where it is collected on a slide for examination. The contents of the seminal vesicles are then obtained by a compression (hoeing) movement.

For diagnostic purposes, one must irrigate the urethra after prostatic massage so that a more accurate picture of the vesicular contents may be ascertained. The prostatic secretion is fluid and milky-white. That of the seminal vesicles is mucoid, clear, and sticky. The two do not mix when expressed together. Any extreme nodular condition in the prostate gland deserves thorough investigation to ascertain the presence of tuberculosis or early malignancy.

Microscopic Examination

The cellular elements of the prostatic and vesicular fluids are examined under cover slide by high dry lens. Polymorphonuclear count is our best guide to the severity of infection. Five to ten per field is considered normal. Any increase in this number signifies infection. This is also our best means of knowing the benefits received from treatment. Blood in the expressed fluid is of little significance and usually is the result of massage. Spermatozoa are always present in the vesicular fluid and their motility should be noted. Typical gonococci are found to be intracellular in acute specific prostatitis.

Typical gram-negative diplococci are found in the chronic cases, and are usually the degenerated forms of old standing infections. They have been described as avirulent gonococci due to the fact that there are no active clinical symptoms of gonorrhea. Neither do they transmit active clinical gonorrhea. Streptococci and staphylococci are found in the greatest number of smears. A very large number of cases which clear up rapidly on treatment show *B. coli* almost exclusively.

There are some forms of prostatitis from which no pathological fluid may be expressed, in spite of other positive findings. In these cases, undoubtedly, the infection must be interstitial or in stroma of the gland away from the tubular structure. Massage will not bear evidence of cellular or bacterial elements.

Vesiculitis most frequently accompanies prostatitis and is likewise frequently overlooked. Where the complaints are sexual, they arise from this source. Normally the ducts extend laterally and backward from the upper margin of the prostate on either side. Vesiculitis is diagnosed, as in prostatitis, by tenderness, tumefaction, and the expression of purulent contents on massage.

Treatment

Early diagnosis and proper management of the acute forms have always been the answer to eliminating the chronic process. The management of acute gonorrhea today in the anterior form has been simplified by the use of sulfanilamide (prontylin) in conjunction with filtrates and lysates which are marketed by reputable pharmaceutical houses. In the past, treatment of anterior urethritis by irrigation, and highly concentrated drugs was responsible for a high percentage of these cases, becoming posterior and eventually chronic. These aids have eliminated self local treatment and made possible the cure by general constitutional defenses. Sulfanilamide is of value in many of the chronic forms of prostatitis and merits a trial in the routine treatment. In non-specific prostatitis, focal infection elsewhere in the body has been the biggest factor in etiology. At the beginning of treatment in this form, one should clear up all possible foci of infection; such as abscessed teeth, tonsils, and chronic sinusitis. In my experience obscure abscessed teeth have been the greatest causative factor. When these primary infections are outside of the prostate, symptoms will be benefited only temporarily. Recurrences cause loss of faith in treatment and these patients resume their chronic invalidism to become victims of radio and newspaper advertising, where thousands of dollars are wasted annually. The medical profession should and must take this condition more scientifically and seriously to discourage this practice by unethical individuals in radio-advertised institutions.

Sedentary life must be advised against. Exercise in the open air, away from bridge tables and automobile joy rides, will greatly aid in the cure of many patients. Mental security with the assurance that good health may be attained only through long and regular treatment must be emphatically stated at the onset. Persistent treatment and vigilance after an apparent cure is neces-

sary to these cases. In my experience, three months has been the minimum to effect the majority of cures in chronic prostatic disease.

Local Treatment

Heat and massage have long been recognized as the factors in local treatment of this disease. Massage, too, has been the cause of a great number of these patients' going untreated or discontinuing treatment.

This may be accounted for by, first, the inability of the doctor to know how to give a comfortable massage and, secondly, the financial inability of the patient to continue treatment for the time necessary to effect a cure. Short, gentle treatments in the first stages with the patient as nearly relaxed as possible will help maintain confidence. It is at this stage that the nervous patient with a tender prostate will decide "the cure is worse than the disease". As the local condition becomes more quiescent, rigorous treatment, as described, may be instituted. Heat in conjunction with massage hastens the process of healing and is a valuable adjunct in hastening recovery. This has been administered by many methods from the Sitz baths to expensive electrical modalities. They all serve the purpose, to some degree, of administering local heat, which brings about increased circulation to the prostate and peri-prostatic tissues. The physiologic response to local heat is vasodilatation and consequently engorgement of blood to the part treated. There is very little good attained by tissue conductivity. This is evidenced by rectal temperature readings when a heat applicator is placed in the vaginal vault. When the temperature of the vaginal vault is brought up to 120 degrees, as registered by a thermometer electrode, the rectal temperature is seldom found to be raised over two degrees. The time element must be considered at this point. Advice has been given to extend treatment from 30 minutes to one hour or longer. It is my impression that the height of physiologic response occurs in fifteen minutes. This may be shown by submerging one's foot in an open vessel of hot water. After fifteen minutes, the vasodilatation of the vessels on the dorsum of the foot gradually disappears, and the foot through normal chemical changes starts its dehydration process. Heat treatments beyond fifteen minutes render very little beneficial results and from an economic standpoint save valuable time for both patient and physician.

For the past six years I have been applying heat and massage by means of a cast aluminum bar, which is equipped with a water circulating mechanism. More complete massage may be given in this way than by the examining finger. My first thought of this device was purely as a means for the administration of heat. The first device was a cast aluminum plug with circulating brass tubing. However, after using this plug a short time, it was found that upon slight manipulation during the treatment, considerable prostatic secretion was obtained. The shorter plug was lengthened so that the seminal vesicles might be reached. A small irregularity or knob was added to one side at the terminal end of the bar to aid in exerting more localized pressure in the

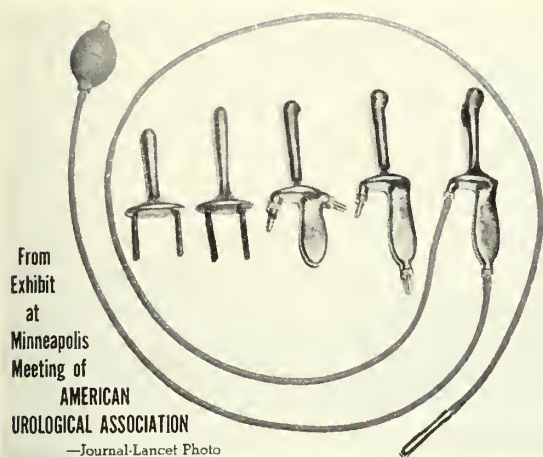


Fig. 2. Evolution of Bar.

diseased area. Following this, a ridge was added on the back of the bar, which was not so high, and considerably longer and used principally for stripping the prostate lobes. A handle was also added which acted as a thermal guide for the circulating water and made possible easier massage. In size, the bar is slightly longer than the ordinary examining finger. It is constructed of aluminum and the circulating coil within the bar and handle is brass tubing. The small irregularity at the terminal end of the bar simulates the slightly flexed finger. This irregularity has been designated as the *vesicle stripper* and serves the purpose of stripping the vesicles in treatment of vesiculitis. It also acts as a stripper when the gland is large and more pressure is to be exerted. This, however, is only done in cases where more vigorous massage may be tolerated. Just opposite the vesicle stripper, and at the terminal end of the bar, is a small ridge which is termed the *lobe stripper*. The hot water is circulated in the brass coil by a one-way pressure bulb. This bulb is held in the grasping hand which is submerged in hot water at the desired temperature. By pulsating this bulb, water is forced through the coil and out the return tube. At the end of the return tube is a metal tip which serves a two-fold purpose. First and most important in the proper treatment is a clean lower bowel. This tip is so constructed that it serves the purpose of a self-retaining enema tip and is used as such at the beginning of treatment, when necessary. Further than this, it acts as a weight to hold this end of the tube for control of waste water. In the manipulation of this instrument, the handle, which is held by the operator to help retain the instrument within the rectum, acts also as a thermic indicator of the temperature of the bar, due to the fact that the inflow of water passes through the handle. Never will the bar be too hot to render damage by burns to the rectal mucosa as long as the temperature of the handle can be easily tolerated by the operator's hand. A great advantage to this instrument is the fact that it may be taken into the bath tub and localized heat administered in the customary Sitz bath. Further, this instrument possesses the possibility of administering contrasting temperature

of hot and cold as is practiced in this treatment by many and which has merit as a circulatory stimulant.

Method of Treatment

After complete rectal examination, the bar is gently inserted according to the method of inserting the examining digit. Water is then circulated through the bar for 15 minutes. This is usually done by the patient and needs no supervision. The temperature of the water is gradually raised from 105 to 112 or 115 degrees. After the prescribed treatment time, the bar is extended laterally to either side of the upper ridge and the vesicles are stripped by a "hoeing" movement of the bar. The bar is then rotated one-half turn in the examiner's hand and the lobe stripper is brought from the lateral margin toward the median furrow, either by rotation of the bar in the tender cases, or by sliding the bar with the comfortable desired pressure. Never should stripping a gland cause any appreciable pain. It is better to only apply heat in these very tender cases until such time that massage may be tolerated. After the lobes are completely stripped, the bar is again rotated to the original position and the seminal vesicles are restripped. This, I find, is important due to the fact that some of the prostatic fluid is forced back through the ampullae, and will be removed by this secondary massage. The vesicle stripper is then carried down through the median furrow and all secretions collected in a groin napkin. Positive guides to benefits obtained in all cases are first the relief of symptoms and secondly the diminution of the cell count of the evacuated prostatic and vesicular secretions. More complete evacuation of the gland and vesicles by bar massage is proven due to the fact that after ordinary massage considerable prostatic secretion will be obtained by resorting to the bar method.

The objection that this is a rigid instrument has been the chief complaint by men that have used the instrument. Surely the gloved finger must be held rigid to give thorough treatment in massage. I have proctoscoped many of these cases, both after digital massage and bar massage, and find that there is less trauma to the rectal mucosa in bar massage. I have yet to see sufficient trauma to show blood upon the withdrawn instrument. The gloved finger creates considerable traction on digital massage, resulting often in marked trauma to the rectal mucosa due to the fact that lubrication is lost on insertion of the finger into the rectum. The physician experiences some difficulty on the initial passage of the bar, but after a few treatments it becomes so easy that the patient frequently passes it himself and starts the heat treatment.

Conclusions

1. Prostatitis is often referred to as "an old man's disease." Considering the venereal origin of most cases, it is distinctly a "young man's disease". Symptoms are most frequently manifest in later years.
2. Prostatitis is the most common disease in men above the age of 18 years.

3. Removal of all possible foci of infection is important to effect permanent cure.

4. Exercise and improved general health hasten recovery.

5. Rectal examination is an important part of the routine physical examination.

6. Prolonged and continuous massage two or three times weekly is often necessary to bring about relief.

7. The application of heat locally encourages the circulation and brings about additional nutrition to the infected prostate.

8. Relief of symptoms and diminution of cell counts of the prostatic secretions are our only guides to benefits obtained.

9. Massage by the hydro-therapeutic massage bar has in all cases brought reduced symptoms and brought about more satisfactory results.

College Mental Hygiene Methods*

II. One Year's Experience With a Scheme for the Early Detection of Personality Disorders Among Students**

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THE MAGNITUDE of the problem of college mental hygiene has been pointed out many times, yet methods of approach to the problem have been puzzling to educators and student health departments. It is not common, therefore, to find in a college or university a well integrated scheme for the detection and management of personality difficulties among the student body. Obviously a simple, workable plan is necessary to meet the needs of the great number of unstable students in our colleges and universities. The general plan proposed by one of us¹ in a paper read before this association in 1932, which was in force over a period of four years at the University of Pennsylvania and found serviceable, did not meet all of the requirements. It did not reach directly the student in need of immediate help. In a recent contribution we presented the plan with which we had been working and attempted to assay its positive and negative features. We also presented the enlarged plan at the same time.² This afternoon we should like to discuss this method which we have found valuable and readily applicable, together with some of our results.

We have already pointed out as a part of the method the importance of making the faculty mental hygiene conscious through reprints of articles concerning the mental health of college students. The need of a well-chosen group of personnel officers and freshmen advisers has been emphasized, together with a vocational-psychological department working in connection with the mental hygiene department. A very essential aspect of the plan is an alert medical personnel in the health service to differentiate the somatic disorders from those which

arise from a psychogenic basis. The most important part of the whole scheme is to reach the student who needs help as directly and as promptly as possible. Our efforts in the past year and a half have been focused on this phase of the problem.

To do this Patry,³ Emery,⁴ and others have urged that mental hygiene courses be offered to students. In some universities this is being carried out with success. In the Wharton School, the largest of the colleges at the University of Pennsylvania, four lectures are given by the psychiatrist each year as part of a general orientation course. The material presented in these discussions covers mental hygiene needs and the concepts of a well-balanced life. The lectures are concluded by a brief description of the function of the college mental hygiene department, and the students are left with the knowledge that there is a service founded primarily to assist them. A course of lectures also has been given as an elective in the department of education. This consists of thirty-three hours of lectures covering the field of psychiatry with special emphasis on the early recognition of personality deviations in adolescent children. The response to this elective course has been most encouraging.

In spite of the fact that such an organization of mental hygiene effort had been quite satisfactory and, in a limited way, productive of gratifying results; yet it had a weakness in that it failed to contact at the earliest possible moment many of the students in need of help.

Frankwood Williams proposed a modified "army technique" for making immediate contact with the unstable student. He suggested that the psychiatrist be in the line-up of examining physicians at the time of the students' entrance examinations and have a few minutes conversation with each student. Cobb,⁵ at Harvard, made a brief neuropsychiatric examination of 1,141 students at the time of entrance into college. He found that 16.4 per cent gave a neurotic history in response to

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questions concerning personal history, family history, and present complaints. Cobb felt that fifteen minutes were inadequate even for a cursory examination. He concluded that the history is the best guide to nervous instability. Eight physicians were employed to carry out their tests. The magnitude of such a study, valuable as it is, precludes its application where there is a limited personnel.

Peck,⁶ on the other hand, pointed out the advantages of a routine mental examination of college students. From the study of his cases, he came to the conclusion that such an examination would be of definite benefit to the students.

In a critical review of our mental hygiene program, many cases referred to, or coming to the psychiatrist voluntarily over a period of several years, were carefully studied to determine how some of the unfortunate developments in them could have been prevented. It became obvious to us that the routine student health questionnaire made out by the new students entering the university could serve as a valuable source of psychiatric information and symptomatology, and enable us to detect unwholesome trends at that time. This, followed by an interview when indicated by the questionnaire, seemed to be an effective way of contacting the emotionally unstable student at the earliest possible moment. It is this part of our plan which we should like to emphasize.

At the University of Pennsylvania, every freshman and every other new student except those in the law, dental, and graduate schools, fill out a detailed questionnaire, called the "Physical Examination Form of the Student Health Service," as a routine phase of his entrance into the university. The present examination forms in use at the Student Health Service of the University of Pennsylvania are a composite prepared by Drs. H. S. Diehl and H. D. Lees. Emphasis throughout is put upon the problems and disorders especially characteristics of the college student. The questions are designed to bring out a remarkably thorough psychiatric history. A similar form now seems to be in rather wide use in other colleges and universities. Possibly all of you are familiar with this form; but we should like to call attention to the fact that from a study of the questionnaire alone a fairly comprehensive view of the student's personality and emotional integrity may be obtained. As will be seen from examination of the portion of the form shown, the data secured include a serviceable family history, the past medical history, the circumstances under which the student lives, how he uses his spare time, and the regularity and correctness of his dietary and sleep habits. A review of his history by systems includes many symptoms which frequently have a psychogenic origin. On page four of the questionnaire is a brief but valuable psychiatric history. Six direct questions elicit some abnormal traits that may offer valuable clues to the psychiatrist who reviews the data. The student is not at all conscious of giving a personal psychi-

atric history; and consequently, is not on guard against "a lot of psychological stuff." In actual practice, the replies to the questionnaire have been remarkably accurate.

Each questionnaire is submitted to a member of the psychiatric department for evaluation after the physical examination is recorded. One to two minutes is ample time in which to review it. Questionnaires that contain data considered significant from a mental hygiene standpoint are marked in accordance with the severity of the problem presented. Students whom we believe to require immediate care are designated "acute" and are seen as soon as possible after the questionnaire is examined. Those presenting relatively severe, but not acute, neurotic symptoms are designated "serious" and are marked with two stars. Regular notices are sent to them to report to the health service for further check-up on their general conditions. No mention is made of the psychiatric significance of their questionnaires. An hour is allowed for these interviews with students whose questionnaire seems to indicate definite emotional instability. Those students whose questionnaires give general clues as to a moderate degree of nervous instability are designated "moderate" and are marked with one star. They are taken up for routine interviews after all of the more urgent cases have been seen.

Many students receiving notice are somewhat concerned and a little fearful about the possibility of some serious physical defect. This is especially true of those who have been told at some time that they have a "murmur" or "heart trouble." At the beginning of the interview, the student is put at his ease by the friendly attitude adopted by the psychiatrist. Everything possible is done to eliminate the feeling that he is being examined by the psychiatrist. The student is told that the notice he received is part of the routine program of looking after the students' welfare and that it is not thought he has anything seriously wrong. He is made to feel that the health service is really interested in him. The physical symptoms he checked are taken up first, and special attention is given to those involving insomnia, fainting spells, nervousness, speech difficulties, nervous breakdowns, paraesthesias, or other possible psychogenic symptoms. The student is then asked about the direct psychiatric questions he checked just as he has been asked about the physical symptoms. After the material on the questionnaire has been discussed his family relationships and early personal history are reviewed in a matter-of-fact way. The student is encouraged to talk freely about his future plans, and the interview goes on more as a friendly inquiry into the student's general plan of life than a specific investigation into any nervous or psychological disorders. If during the course of the discussion the psychiatrist is led to believe that the student is suffering from a major emotional disorder, the interview is gradually directed toward that problem and the student is encouraged to return if he wishes further help. Complete records of these interviews are kept by the mental hygiene department of the health service. In the majority of cases the completed questionnaires from

those students who have been called in by us check closely with the more detailed information obtained in personal interviews.

It should be pointed out that not all of the students whose questionnaires seem to indicate emotional instability are found to be unstable at the time of the interview. This is readily understood when one considers the nervous tension that is frequently present in students before final examinations. Some students who are ordinarily well adjusted checked nervousness, worries, and the like to indicate their feeling during such times of stress.

The overwhelming majority of students accept the psychiatric interview very graciously. They are not only fully coöperative, but express gratitude and appreciation for the interest taken in them. It is very gratifying to find that the students who we believe need help most seriously welcome the opportunity to begin a therapeutic procedure. It is remarkable the degree of frankness with which the majority of students launch upon a discussion of their problems. We have also found that this single interview is not infrequently sufficient to eradicate fears and perplexities that have potential danger. In general, whether the student is asked to return for subsequent interviews or not, the response has been most satisfactory and such statements as, "Doctor, I certainly want to thank you for your time, and I want you to know that I appreciate this," are common.

During the academic year, 1936-1937, 1,750 questionnaires were examined for significant information pertaining to emotional instability in the students. Of the total number, 294 or 16.8 per cent seemed to have "acute" or "serious" emotional maladjustments of such proportions that it was thought advisable to interview these students as soon as possible. Eighty-five per cent of these 294 students responded to the notices which were sent by the mental hygiene department to return for a further check-up. They were all seen during the first semester except those entering the university the second semester. Three hundred and fifty questionnaires, or 20 per cent of those evaluated, showed evidence that the students who checked them were aware of minor emotional stresses of some sort. These were designated as the "moderate" or one-star questionnaires. Four hundred and seventy-five, or 27.1 per cent, checked one or two things indicating some slight difficulty. It is significant to note that one full-time psychiatrist, one part-time psychiatrist, and one secretary were able to review these cases during the year, and at the same time carry on therapeutic interviews with the students who required treatment.

TABLE 1.

Degree of Emotional Instability Indicated by Questionnaire.

	Number	Percentage
Acute or serious (two-starred)	294	16.8
Moderate (one-starred)	350	20.0
Slight	475	27.1
Stable	631	36.1
Total	1750	100.00

Among the students who had checked "nervous breakdown" in the questionnaire, three apparently had had

schizophrenic episodes prior to their admission into the university. According to their histories, seven had had depressions of varying degrees of severity. It was possible to give all of them helpful suggestions concerning university life and how they could best adapt themselves to it.

Twenty-seven students returned voluntarily for psychiatric assistance in overcoming emotional problems. Among these students were four cases of anxiety hysteria, twelve anxiety states, four obsessive-compulsive states, four cases of manic-depressive psychosis, and three others. Twenty of them were from the "serious" or two-starred group, and seven from the "moderate" or one-starred group. It is significant that from an examination of the questionnaires alone it was possible to place such a high percentage of students needing immediate help in the two-starred group. The time interval between the initial interview and the second one varied. The diagnosis was not established in all of these cases at the time of the first interview; but it was certain at the time that all of them were emotionally unstable.

During the year, fifty students were referred to the mental hygiene division of the health service because of major emotional difficulties. On the basis of the information contained in the questionnaires alone, twenty-four of these students would have been called in. Eighteen of them would not have been called in. Of the eighteen who would not have been called in, about two-thirds had problems arise after they had entered the university. It is not likely, therefore, that there would be any evidence of emotional difficulty in the questionnaire filled out at the time of admission. Eight of the referred students were from schools requiring no questionnaire.

Twelve students were found to have psychoses at some time during the year. There were seven cases of manic-depressive psychosis, one reactive depression, and four cases of schizophrenia. Two of these students presented definite schizophrenic reactions at the time of admission. Both of them were sent to us by members of the faculty as emergency problems and were subsequently withdrawn from school. They were at the time of admission to the university obviously incapable of answering accurately questions pertaining to their personality make-up. It is interesting to note that they would have been requested to come to the mental hygiene department because of significant material in their questionnaires. One student had not fully recovered from a depression. She was called in shortly after the beginning of the semester because of the data in her questionnaire indicating difficulty. It was possible to give her some valuable suggestions concerning her immediate course in the university. Although some of the others were extremely unstable at the time of admission, they did not become psychotic until later. Seven of them had to withdraw from the university. One committed suicide after his family had been informed and warned of the seriousness of his condition. Four mild cases were able to carry on. In this group there were ten new students, five of whom were transfers, and only two old students. Of the new students eight were detected by means of their questionnaires and two were in schools not requiring the student

to fill out a questionnaire. The value of contacting these students before they became psychotic is obvious.

We have found, as have others, that the stress of academic application and pure intellectual effort play a small part in the actual production of many of the problems which are brought to the college psychiatrist. The roots of the difficulties most frequently reach back to the home soil of the individual. Such factors as unstable parents, close parental attachments, spoiling during childhood and early adolescence, and strained family relationships or broken homes stand high in the list of etiological factors. Conflict over sex, somatic disorders, financial stress, and striving to attain eminence in university life also play a contributory rôle. The job of maintaining the emotionally unstable boy or girl in the precarious setting of college life is the lot of the college

psychiatrist. It is our feeling that the entrance student health questionnaire is a valuable implement for the detection of these unstable students at the time they are launched upon their college careers.

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Book Notices

MENTAL HYGIENE IN PEDIATRICS

A Pediatrician in Search of Mental Hygiene, by BRONSON CROTHERS, M.D.; 1st edition, red cloth, library labels, no illustrations, no index, no bibliography; New York City: The Commonwealth Fund, Inc.: 1937. Price, \$2.00.

In regard to this volume, one might say that the author went out in search of mental hygiene, but either he was dressed badly or the day was too hot, for after a short while, the reader found him fast asleep! The author is assistant professor of pediatrics in the Harvard Medical School.

KOLL'S UROLOGY

Medical Urology, by IRVIN S. KOLL, M.D.; 1st edition, heavy cloth, gold-stamped, 431 pages, 92 illustrations; Saint Louis, Missouri: The C. V. Mosby Co.: 1937. Price, \$5.00.

This textbook has been written for the general physician where consultation with a urologist is not always available.

More attention is paid to details in treatment of urologic conditions of interest to the general practitioner than is usually found in more comprehensive texts.

The ordinary pitfalls and complications in the treatment of gonorrhea are dealt with in a brief, concise manner. The minor surgical procedures are presented for practical use; but more complicated surgery is avoided. Urologic diagnosis and differential diagnosis are thoroughly outlined in separate chapters.

The author furnishes the reader with the more recent opinions on such subjects as rejuvenation, sterility and nutritional factors in calculi formation.

RUSSIAN MEDICINE

Russian Medicine, by E. HORSLEY GANTT, M.D.; 1st edition, red cloth, black-stamped, 198 pages plus bibliography, appendix and indices, 12 illustrations; New York: Paul B. Hoeber, Inc. (Harper Medical Books): 1937. Price, \$2.50.

This is a sober, sound, well-authenticated work on past and present Russian medicine, written in dispassionate tone, with adequate substantiation of the points made. It is much preferable to the current *Romance of Russian Medicine* of MICHAEL L. RAVITCH, M.D., for the bibliography is complete, quotations are exact, and the tone is considered and judicious. It is one of the *Clio Medica* series of which E. B. KRUMBHAAR, M.D., is the general editor. Dr. GANTT was chief of the medical division of the Leningrad unit of the American Relief Administration in 1922-1923; and was a student under IVAN PETROVICH PAVLOV from 1925 to 1929. This is a recommended book.

SCHINDLER ON GASTROSCOPY

Gastroscopy: The Endoscopic Study of Gastric Pathology, by RUDOLF SCHINDLER, M.D., preface by WALTER LINCOLN PALMER, M.D.; 1st edition, black cloth, gold-stamped, 309 pages plus bibliography, index, and atlas of plates in color, 89 text figures, 96 color reproductions; Chicago: The University of Chicago Press: 1937. Price, \$7.50.

Dr. SCHINDLER's work is thoroughly new; that is to say, it is not another edition of the justly celebrated *Gastroskopie* of 1922. New material predominates, although it is to be expected that some content of the earlier work has been incorporated. There is not much to be said concerning the physical and mechanical characteristics of gastroscopy, for the great value of this technic in diagnosis and observation are by this time apparent to all. Perhaps the reader's first impression in reading this work is expressed by Professor PALMER in his foreword: "I shall never forget the thrill of the moment 10 years ago when Dr. SCHINDLER first enabled me to behold the interior of the living human stomach!" This is an excellent text, beautifully illustrated.

BIOCHEMICAL TEXT

A Textbook of Applied Biochemistry, by FRANK WOKES, B.Sc., Ph.C., F.I.C.; 1st American edition, heavy blue cloth, gold-stamped, 488 pages plus appendix and index, 79 illustrations; Baltimore: William Wood & Company: 1937. Price, \$5.00.

This excellent text respects the British *Pharmacopoeia* (1932), and is in part the result of lectures delivered by the author before the London Pharmaceutical Society in 1931-1932. It should be useful to any student of pharmacy, to pharmaceutical analysts, research chemists, etc. Completed in November 1936, it treats of the very latest developments in pharmacy and pharmaceutical science on record up to that date.

The author is a member of the staff of the Pharmacological Laboratories of the College of the Pharmaceutical Society of Great Britain. THE JOURNAL-LANCET recommends this text.

HYGIENE TEXT

Personal Hygiene, by CLAIR ELSMERE TURNER, M.A., Dr. P.H.; 1st edition, dark green cloth, gold-stamped, 306 pages plus appendices, glossary and index, 84 text illustrations and 3 color plates; Saint Louis, Missouri: The C. V. Mosby Company: 1937. Price, \$2.25.

This is a small hygiene text for students at the college age level, and as such has little interest for physicians, excepting those who are associated with college student health services. It is complete enough for its mission, and is well illustrated. The background is sound, and many health educators in divers colleges have aided the author. Dr. TURNER is professor of biology and public health in the Massachusetts Institute of Technology at Boston.

The JOURNAL LANCET

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CHILD HEALTH WEEK AND THE JOURNAL-LANCET

For several years THE JOURNAL-LANCET has participated in the observance of Child Health Week, by devoting the May issue to the subject of Pediatrics. Again the LANCET contributes its influence to the important problem of conserving the health of children. It is hoped that our readers among the medical profession will find information in these pages which will materially aid them in discharging their responsibility for the health of their young patients. This is the objective of the May number of THE JOURNAL-LANCET.

C. A. S.

THE VITAMIN PARADE

Pediatrics has probably advanced more than any other branch of medical science during the past 25 years. Research workers who take the game of hide-and-seek in earnest go right on with unrelenting assiduity, prodding into remote corners of the unknown in quest of undiscovered substances. If vitamins continue to come out of hiding at anything like the rate they have been doing in recent years, we shall soon run out of letters in the alphabet. Vitamins which are present in minute amounts in natural foodstuffs but whose compositions are yet but little known, have been shown to be essential to normal metabolism.

Vitamin A, obtained from butter, fish liver oils, yellow plant and animal substances, promotes growth and

strengthens resistance to infection. Vitamin B₁ is the antineuritic sometimes called B-P (beriberi preventive). Vitamin B₂, sometimes called P-P (pellagra preventive), is an antidermatitic and a growth factor. Vitamin C, contained in fresh citrus fruits and tomato juices, is an antiscorbutic and is essential to healthy gums and teeth. The Council on Foods and on Pharmacy and Chemistry have decided to call it by the name of ascorbutic acid. Vitamin D, popularly known as the sun ray vitamin, is contained in ergosterol, egg yolk, and yeast. It is antirachitic and related in its effect to Vitamin A in the promotion of growth and of sound teeth in young children. Vitamin E, contained in various oils and green salads, is a reproductive or antisterility factor. Vitamin F is necessary for a healthy epidermis and may be a factor in the maintenance of normal blood sugar. Vitamin G is essentially the same as B₂ in promoting growth and normal repair, in delaying senility, and in being necessary for the purpose of blood regeneration. A substance tentatively called Vitamin K has been found in hog's liver fat and in alfalfa. Work is being done upon its relationship to the hemorrhagic diathesis, especially with the coexistence of jaundice.

There is a hiatus between G and K and still a number of vacancies after K. How and when they will be filled we cannot predict, but certain it is that we are now enjoying a great field day in problems of nutrition and growth. We are looking with great interest to the completion of the race, take it any way you like.

A. E. H.

NICOTINIC ACID, VITAMIN B, AND THE PELLAGRA SYNDROME

Since the pioneer studies of the relationship of diet to pellagra launched by Goldberger, Chittenden and Underhill¹ nearly a quarter of a century ago, scientists have shown that diets similar to those associated with the development of human pellagra produce a disease in dogs known as black tongue. Analytic comparison of these diets with those which prevent and cure pellagra in man and black tongue in dogs, has resulted in the discovery that nicotinic acid² effectively prevents and cures each of these two diseases. Apparently the relationship of this acid to human pellagra is as specific as the relationship of vitamin C (cevitamic acid) is to scurvy.

Currently pellagra is considered to be a clinical syndrome characterized by symptoms referable to the alimentary, dermal and nervous systems. Recent studies³ have shown, however, that the oral administration of nicotinic acid promptly relieves the stomatitis, glossitis and mucous membrane lesions of pellagra and gradually cures the cutaneous manifestations of the disease; but has no effect on the peripheral neuritis from which some pellagrous patients suffer. Prompt relief of the pain of neuritis by intravenous injections of crystalline vitamin B (thiamin chloride) has been obtained recently by Spies and Aring,³ and this improvement was noted regardless of whether the pellagra followed long-standing ingestion of alcohol or was the result of protracted subsistence upon an inadequate diet. These observations suggest that some of the clinical manifestations of the pellagra syndrome may be the result of a deficiency of more than one essential nutrient.

Apparently advances in the fundamentals of nutrition not only clarify our understanding of the physiologic rôle of specific indispensable nutrients, but also serve to define the clinical manifestations of the disease produced by a deficiency of different essentials of nutrition.

1. Goldberger, Chittenden and Underhill. *Am. J. Physiol.* 44:13, 1917.

2. Elvehjen, Madden et al. *J. Am. Chem. Soc.* 59:1767, 1937.

3. Spies and Aring. *J. A. M. A.* 110:115, 1938.

C. A. S.

ADVANCES IN TREATMENT OF PULMONARY ABSCESS

The treatment of pulmonary abscess has been definitely facilitated by the instrument which Wangenstein presented and described in the December, 1937, issue of the *Journal of Thoracic Surgery*. There is usually a period of ten to fourteen days after the onset of symptoms before spontaneous rupture occurs. Every physician should be on the lookout for the development of abscess and from symptoms, X-ray findings, and other phases of the examination, arrive at a reasonably accurate diagnosis before rupture has occurred. When the diagnosis is established or if abscess is even strongly suspected, bronchoscopy may be indicated. Not only is this of great value in differential diagnosis but occasionally the removal of obstructing material, such as mucous plugs, will establish free drainage.

Unfortunately, abscesses are not always so located that they can be reached with the bronchoscope. If all pulmonary abscesses could be treated in the same manner as we treat abscesses elsewhere in the body, namely, by establishing free drainage at the earliest indication, many persons would be spared long periods of invalidism from the chronicity of the abscess, as well as its complications, and the mortality would be lower. While it is true that a fair percentage of pulmonary abscesses heal spontaneously after rupturing into the bronchial tree, one may force the patient to take considerable risk by waiting for this to occur. Not only is there the danger of the abscess spreading to other parts of the lung but also of the infected material being aspirated after it has reached the bronchial tree. Moreover, there is always the possibility of pulmonary abscess rupturing into the pleural cavity with resulting mixed infection empyema.

An abscess that would heal spontaneously after rupture into a bronchial ramification, should also heal when surgical drainage is established, with less risk to the patient. Wangenstein's instrument places in the hands of the physician a method of drainage which prevents internal hemorrhage and causes minimal destruction of lung tissue. By this method, abscesses can be treated early and, thus, a higher percentage should heal in a short time than by any method previously employed.

J. A. M.

DAKOTA MEETINGS

The editors of THE JOURNAL-LANCET wish to extend congratulations to the medical societies of both the Dakotas for the interesting programs which have been arranged in connection with the annual meetings. The South Dakota State Medical Association is holding its 57th annual session at Huron on May 9, 10, 11; the North Dakota State Medical Association meets at Bismarck on May 16, 17, 18, for its 51st annual convention. Testimony to the progressive attitude of the physicians of the Dakotas is to be found in the character of the programs arranged. These are given in full on pages 260 and 261.

The purpose of state medical association meetings is to give doctors of the state an opportunity to bring themselves thoroughly up to date on the important new developments in medical practice. The Dakota meetings meet this requirement, for they will bring into these states distinguished authorities on medicine, obstetrics, dermatology, surgery, ophthalmology and the like, from Illinois, Iowa, Missouri and Minnesota.

The South Dakota Academy of Ophthalmology and Otolaryngology will also meet in Huron on May 10. A particularly interesting feature of the North Dakota meeting is the scheduled preview of the motion picture, "Birth of a Baby," which has been causing such furore all over the U. S. When a preview of this picture was given in Minnesota, physicians voted overwhelmingly in favor of its showing to the public.

J. A. M.

Societies

SCIENTIFIC PROGRAM OF THE MINNEAPOLIS CLINICAL CLUB

Eighteenth Anniversary Meeting, January 13, 1938

D. D. Turnacliiff, M.D., Presiding

TWO UNUSUAL CASES OF CARDIAC DYSPNEA

F. H. K. SCHAFF, M.D.

MINNEAPOLIS, MINN.

I want to report these two cases because they present some rather unusual symptoms and at the beginning were a bit confusing. The trouble in teaching cardiac therapy is that there has been a great deal of difficulty in establishing certain facts regarding the mechanism of heart failure and of dyspnea. I think Doctor Barron's discussion is certainly going to be worthwhile.

One of the difficulties that we have had has been the differentiation between congestive heart failure and peripheral vascular failure; when we realize how little understanding there is of these two main types of cardiac failure and when we see the almost childish faith that some physicians have in the use of digitalis, it is up to us to establish certain definite entities and show when certain drugs should be used and when they should not be used. I do not believe anybody has done more than Dr. Harrison and Dr. Blalock during the last seven years to clarify the subject; but it is disappointing to see how little understanding some men who practice surgery have, of the significance of shock, or so-called peripheral vascular failure, when they use digitalis in postoperative shock and in peripheral vascular failure following spinal anesthesia. They even use it for thyrotoxicosis. That is the excuse I have for presenting a couple of cases which do present definite indications for the use of morphine and digitalis.

Harrison spoke at the meeting of the Minnesota Pathological Society on cardiac dyspnea and divided it into several types. The paroxysmal type comes on, as a rule, during sleep, is incited by certain reflexes such as a cough or a dream and various other phenomena, but these attacks can occur in the daytime or in the evening before the patients have slept. The first case I want to tell you about is a gentleman about fifty years old who came in on July 20, 1937, complaining of a severe attack of epigastric distress after eating clam chowder. He said the pain was extremely severe, he was covered with a cold sweat, vomited, and then felt better. This recurred the day he came in to see me. The next thing he noticed was that he had some difficulty in urinating. He finally passed a small amount of bloody urine. The diagnosis at that time did not seem difficult at all; his urine was actually bloody and he had a very marked hypertension of 240/130. There was also some albumin in his urine. The blood chemical findings were essentially negative and an X-ray after the injection of neoskiadon, showed that the right kidney was not functioning at all. Following this, a cystoscopy by Dr. Meland showed an obstruction in the lower end of the ureter. In the second cystoscopy, Dr. Meland was able to extricate a number of fragments of stone from the ureter. That is the preliminary history which was not of particular importance except that it confused the picture of a very peculiar attack which occurred on August 20, about a month later, after he had been in the hospital and cystoscoped.

About 9:00 p. m., while eating ice-cream, he was suddenly seized with a violent attack of dyspnea. He was almost unconscious and became so blue in the face, that people called the Police Department and the Fire Department who came

with the pulmotor. He was sent to the hospital, given morphine and put in an oxygen tent; the next morning the gentleman was completely recovered. The next day the right kidney did not show any function whatever. That was the confusing part of the picture. I saw him again about three weeks later at his home and at that time the man was just going to bed when he again developed some dyspnea. I saw him within ten minutes. He was severely cyanosed, almost unconscious, had a blood pressure of 220/130, pulse 100, strong and regular, expiration extremely labored. The man did look moribund. At first, when I examined him, his chest was clear. About five minutes later he developed a typical pulmonary edema, and I felt that it was an extremely severe case of paroxysmal cardiac dyspnea. I gave him 1/3 gr. of morphine and because of the extreme asthma, 7 1/2 mm. of adrenalin. Within ten minutes the man was perfectly comfortable, conscious and laughing about the whole affair.

These cases have been described by many cardiologists. They can become extremely severe and do present one of the cardiac emergencies that we all are apt to meet. If the attack of cardiac asthma is not checked within a reasonable time, the patient may go into a pulmonary edema and die. Eliminating and reducing reflex irritability is the important thing, as shown by Harrison; in many instances, the prompt use of morphine during the attack may save a life, and digitalis afterwards may put the patient back to work for a considerable length of time. I digitalized this patient immediately; (that was in August) and he has been back to work and has had no further attacks. He is perfectly comfortable and able to take care of himself. Of course, the hypertension is persisting. The electrocardiogram of this case did not show anything except a ST segment off the iso-electric line. The use of digitalis is being continued, of course.

The second case, a 47 year-old farmer, was taken sick on December 25th while getting up at five o'clock in the morning. He had never been ill before. He was seized with an attack of violent dyspnea and severe abdominal distention with some pain. At first, of course, his attack was considered a coronary thrombosis; but when more carefully questioned, he really did not have severe pain. The dyspnea and the asthma were most distressing. He had a hypertension of 220/130, was extremely cyanotic and was laboring for every breath. His physician gave him morphine, 3 doses of 1/4 gr. He kept on getting worse and was sent to the hospital December 26th. When I saw the man on that day he was extremely cyanotic, respirations were 38, temperature 99.8, pulse was 110 but perfectly strong and regular. Because he was only 5 feet 10 inches tall, and weighed 270 pounds, I took off 700 cc. of blood and put him in an oxygen tent. He did not improve, in spite of the bleeding and the use of the oxygen; consequently, I gave him 10 cc. of digifolin intravenously because the evidence of an acute congestive failure seemed to justify its use even in a case of coronary occlusion. That did not help a great deal. By the next morning the pulmonary edema was so severe that the frothy expectoration was running out of his nostrils and out of his mouth. He was absolutely unconscious. I gave him a second dose of digifolin and he responded to this, became conscious and perfectly rational; his chest cleared up completely, but apparently a bronchial pneumonia had started, because his temperature rose the following day and fine moist râles reappeared in both lungs. We gave him more digitalis, but in spite of this, in the next 24 hours he developed a tachycardia with a gradual drop of blood pressure, cyanosis and general weakness. This man died from peripheral vascular failure about three days later, probably consequent to his bronchial pneumonia.

Because of the blind faith some men have in the use of digitalis in infectious diseases, particularly in pneumonia, I

think a case of this sort can serve as a good example. In spite of the shortcomings in shock therapy at the present time, it is important to realize the danger of persistent shock; where you have persistent peripheral vascular constriction, it will not last and eventually you get peripheral vascular dilatation. This, because of the damage to the vasomotor center, does not respond to any form of therapy. If we can show when digitalis should be used and when it can be of help, we will avoid the unnecessary use of this drug and encourage the prompt intelligent treatment of shock.

The Mechanism of Dyspnea in Heart Failure

MOSES BARRON, M.D.

MINNEAPOLIS, MINN.

Dr. Schaaf's presentation is interesting as well as important, because it brings up the question when to use and when not to use digitalis in heart conditions. It is important to distinguish between peripheral circulatory collapse and true heart failure, since the treatment is different. I believe that from the history as presented, I would diagnose coronary thrombosis in both cases cited. In the second case, I would suspect a massive thrombosis in the left coronary artery which brought about the rapid downhill course of the patient. The value of digitalis in extreme myocardial damage is still doubtful.

In my discussion I am to consider the present concept of the mechanism of dyspnea. As you all know, dyspnea is probably the most important symptom of congestive heart failure. By understanding the mechanism of this condition, we are better able to provide the proper treatment. As mentioned before, heart failure is of two kinds: one, peripheral circulatory collapse which occurs generally with shock; the other, congestive heart failure which is always associated with diseased hearts. I shall discuss only the latter type in considering dyspnea.

We must realize that whether the heart failure is due to valvular disease, hypertension, coronary disease, dilatation of the aortic ring from syphilitic aortitis or any other cause, the failure itself always rests on muscular fatigue. We realize this in the treatment since we use practically the same method, especially rest and digitalis, in congestive heart failure from any cause whatsoever.

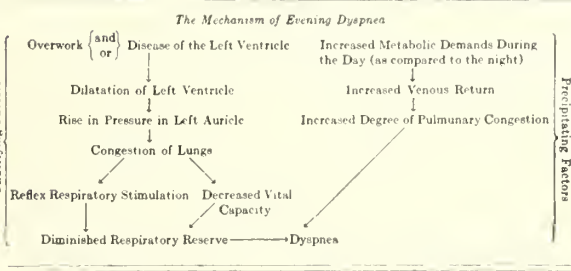
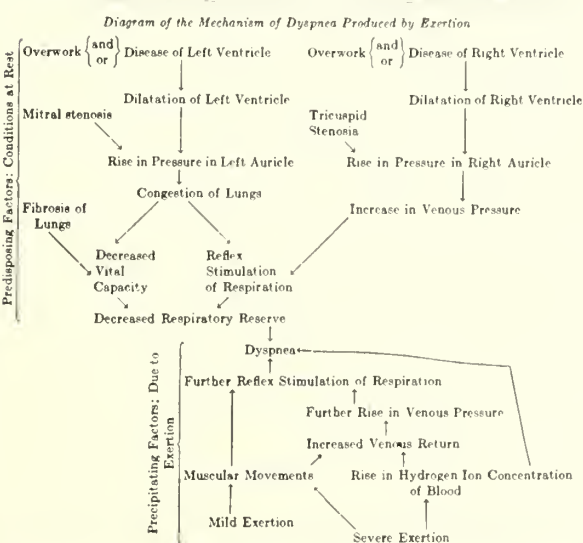
How does muscular fatigue come about? When the heart has to keep on working to propel the necessary amount of blood through the body in spite of embarrassment through various pathological processes, it has to dilate and hypertrophy in order to carry on the work. As the heart enlarges and the muscle fibers hypertrophy, it becomes a less efficient machine. Usually it is the left heart which gives way primarily; only rarely do we get right ventricular insufficiency as a primary condition. What happens in left ventricular failure? We first have the heart muscle under strain which causes a gradual enlargement of the fibers, and then the development of fatigue. A condition soon arises when the left ventricle is unable to propel properly the blood forward under a given state of ventricular filling and pressure. If the intraventricular pressure is increased, then the heart can empty itself better because of the greater stretching of the muscle fibers. Harrison, in his book, gives a very excellent illustration of the profound changes in circulation when the muscle becomes fatigued.

Let us assume that the left ventricle propels forty cc. of blood at each contraction. Through fatigue the ventricle may finally be unable to expel more than 39 cc. of blood at each contraction. During the next ten beats, 10 cc. of excess blood will accumulate in the ventricle. The ventricular muscle now has to stretch to accommodate the increased amount. This increased pressure within the left ventricle will now prevent the inflow of 40 cc. of blood through the left auricle so that only 39 cc. of blood flows in. The left auricle now begins to accumulate 1 cc. of blood at each contraction, since 40 cc. of blood still reaches it from the lungs through the pulmonary veins. In the next thirty beats, 30 cc. of blood will have accumulated in the auricle and therefore increase the intra-auricular pressure. This will now cause a back pressure into the pulmonary veins and thus into the lung parenchyma. By now only 39 cc. of blood can flow through the lungs into the auricles and 1 cc. of blood will accumulate in the lung parenchyma at each heart beat.

Let us assume that it takes 300 cc. of blood in the lung parenchyma to increase the intrapulmonary pressure, which means congestion in the lungs. This increased pressure within the lung will now be able again to force 40 cc. through the pulmonary veins into the left auricle, and the left auricle will be able to force 40 cc. of blood into the left ventricle; the left ventricle under the increased pressure will be able again to expel 40 cc. of blood at each contraction. This alteration in the blood flow has brought about a condition where the left ventricular output is the same as it was before the muscle weakened. The minute volume output is therefore normal, but the circulation is now on an altered basis.

It is necessary in order that the left ventricle shall propel the needed 40 cc. of blood, that it must do so under the increased intraventricular pressure. The patient now has a congestion in his lungs and there is a transposition of blood in the vascular system. Three hundred and forty cc. of blood has been taken out from the systemic circulation since there are 10 cc. more of the blood in the left ventricle, 30 cc. more in the left auricle and 300 cc. more in the lungs. By repetitions of such sequences, the lungs become more and more congested and this congestion with the back pressure on the venous side is the greatest factor in the production of dyspnea. It has been shown that lung congestion alone produces a reflex which stimulates respiration. Accumulation of blood in the veins with increased pressure also has the same effect. The increased volume of blood within the lung parenchyma decreases the amount of air space in the alveoli since the chest wall is rigid. This decreases the vital capacity and increases the dyspnea. The dilated capillaries increase the thickness of the alveolar wall and make the lung parenchyma more rigid. This diminished elasticity of the lung brings about dyspnea, as was first shown by von Basch.

In these charts you will note the different factors that bring about the development of the various forms of dyspnea.



The Mechanism of Cardiac Asthma

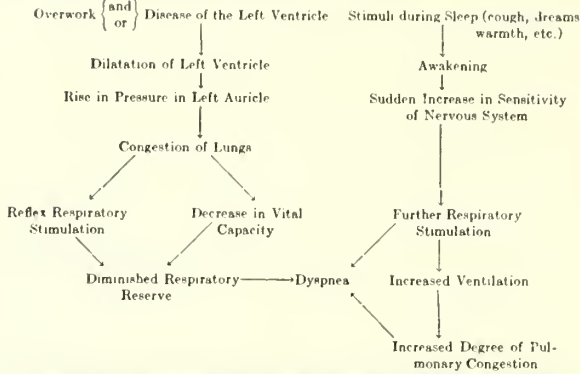
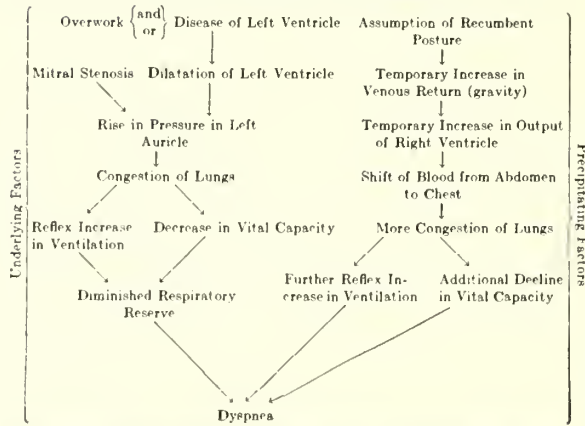


Diagram of the Mechanism of Orthopnea



AUTHOR'S NOTE: It should be noted that assumption of up-right posture

- (1) reverses deleterious factors mentioned above,
- (2) improves chest expansion,
- (3) decreases venous pressure in brain,
- (4) increases cerebral arterio-venous gradient, increases blood flow through respiratory center, relieves stagnation anoxemia.

(Charts from *Failure of the Circulation*: HARRISON.)

From the above, it will be seen that overwork of a diseased left ventricle will gradually produce dilatation and hypertrophy of the ventricle, and, finally, fatigue of the muscles. The dilatation of the left ventricle will be associated with the rise in pressure on the venous side. That is why we call this the back pressure theory of congestive heart failure. The back pressure in the left auricle will cause congestion in the lungs which will result in decreased vital capacity and the reflex stimulation of the respiratory center. There will now be a decreased respiratory reserve. The sum total of all these factors brings about dyspnea. When there is overwork and disease of the right ventricle, the back pressure will be on the systemic veins. This will help to increase the dyspnea but will also result more in edema and anasarca. It has been shown that mere muscle movements alone cause stimulation of the respiratory center and help increase the dyspnea by increasing the respiratory rate.

Discussion

Dr. F. H. K. SCHAAF: I do not agree with Dr. Barron when he says the first case was a case of coronary thrombosis; because if Dr. Barron can make a diagnosis of coronary thrombosis without evidence of pain, cyanosis, leucocytosis, pericardial friction, drop in blood pressure or electrocardiographic findings, he can do more than I can. I do not think there is one single finding that could possibly allow this diagnosis. Furthermore, you do not see complete recovery from a severe coronary thrombosis in fifteen minutes.

In the second case, I am fully aware that the sudden left ventricular failure may have been due to coronary occlusion and myocardial infarction; but because of the severe acute congestive heart failure, I still feel digitalis was indicated. The apparently complete recovery following the second dose probably justifies its use at the time.

Dr. MOSES BARRON: Dr. Schaaf is right in stating that the only real indication for digitalis is congestive heart failure. The etiology of the heart failure makes no difference. However, in acute degenerative diseases of the heart, as in coronary thrombosis, or acute toxic myocardium, one must be very careful in administering digitalis because of the increase in toxic effect.

As to Dr. Schaaf's first case, I do not know of any condition of the heart where we can find no evidence of any heart lesion and yet have a patient suddenly develop a severe attack suggesting shock. Such a condition is best explained by coronary thrombosis. There was some corroborative evidence for this diagnosis. It was stated that the electrocardiogram showed the ST segment to be above and below the isoelectric lines in the different leads.

SYPHILIS OF THE STOMACH

J. M. HAYES, M.D.
MINNEAPOLIS, MINN.

I am presenting this case especially because, to me, it represents most of the classical picture of syphilis of the stomach. The patient is now 38 years old and she appears well and healthy. I saw her first in 1926. She came in then with epigastric distress, nausea and vomiting, loss of weight and occasionally tarry stools. The symptoms were gradually increasing. She showed considerable anorexia and cachexia and was somewhat anemic when first seen. An X-ray of the stomach showed a large central filling defect. A diagnosis of carcinoma was made. I had seen some of these cases previously with Dr. Carmen and suspected syphilis when I first saw her. Dr. Carmen had called attention to the surprise one frequently got when he looked at a large central filling defect, and could feel no mass. The symptoms were relatively mild as compared with the marked pathology of the stomach.

Her Wassermann test was a 4 plus. She was put on anti-syphilitic treatment and for two years was symptom free. Even then the appearance of the stomach had not changed much. After two years she began to have severe hemorrhages. In spite of more anti-syphilitic treatment and repeated transfusions, her hemoglobin went down to 20 per cent. The stomach was then resected and the patient has been comparatively well since. The specimen showed an annular adenomatous swelling of the submucosa, indicative of an inflammatory condition. There was a diffuse lymphatic and plasma cell infiltration, of the perivascular type. In the edge of the specimen a small gummatous area was recognized.

The patient had most of the symptoms of cancer of the stomach but not so severe. She did not appear so emaciated and cachectic as one would expect if this were carcinoma with so marked involvement of the stomach.

After antisyphilitic treatment she was apparently well but the appearance of the stomach did not change a great deal.

Finally when we had to resort to surgery on account of hemorrhage the specimen gave the typical picture of syphilis of the stomach.

Discussion

Dr. S. R. MAXEINER: I would like very much to compliment Dr. Hayes on his interesting presentation and to add two more interesting case reports of my own.

Case 1 is a male of 40 with positive Wassermann and gastric symptoms resembling those of ulcer. Recently he has had vomiting, gastric retention and other signs of pyloric stenosis. A pylorotomy was performed, completely removing the area of obstruction and tumefaction of the pylorus. The patient made an uneventful recovery and was completely relieved of his symptoms. Pathology: microscopic diagnosis was syphilis of the stomach.

Case 2 is very similar to that presented by Dr. Hayes. The patient is a female, age 38, whose past history is essentially negative except for sleeping sickness four years ago. The patient has had six pregnancies, three living children, and three miscarriages at three months. Otherwise she has been quite well until the advent of her present trouble. The present complaint was pain in the stomach after eating with nausea and vomiting and a loss of 48 pounds in weight. The patient is emaciated, weighing only 70 pounds but does not have the sallow appearance of a malignancy. There is tenderness and fullness in the epigastrium, a marked secondary anemia and two Wassermanns reveal a four plus reaction. X-ray study shows a filling defect involving the distal third of the stomach with almost complete obstruction. The filling defect, however, is much more regular than is usually found in carcinoma. The pre-operative X-ray diagnosis, however, was carcinoma of the stomach. An operation was performed at which time the stomach was found to be greatly thickened but gave the impression of an edematous thickened stomach partially filled with mushy substance. It was not hard like the scirrhus type of cancer and there was no glandular involvement or extension to the liver. Sub-total gastric resection was done by the Balfour modification of the Polya operation. Pathological examination of the specimen disclosed a section of stomach four inches by three inches with greatly thickened walls and mucous membrane. The mucosa was irregular and whitish without ulcerative surface; the wall suggested edema. Microscopic sections revealed greatly increased fibers and thickened blood vessels with endarteritis. There was no carcinoma. Microscopic diagnosis was syphilis of the stomach. The patient made an uneventful recovery and gained 37 pounds weight in the first three months. She was subsequently given specific treatment for Lues.

PERIPHERAL NERVE INJURY

A Case Report

A. A. ZIEROLD

MINNEAPOLIS, MINN.

I am presenting a patient who has sustained a peripheral nerve injury. There is nothing particularly unusual or obscure about a peripheral nerve injury, and there is little excuse for its presentation, except that it illustrates one or two features that I believe are worthy of emphasis. There are many ideas and terms relative to nerve injury that we have for many years unthinkingly accepted without question. Up to a very short time ago, it was believed that a nerve trunk was constructed in so orderly a manner that to insure regrowth following section, the fasciculi must be approximated in their former continuity. Dr. J. C. McKinley proved this to be wholly unnecessary by demonstrating the multitude of pathways a nerve fibril might traverse. Another phase of peripheral nerve surgery, with which we have been seriously concerned, is the interval between injury and repair. Of the many neglected cases, a great number are untreated because of the belief that too long a time has elapsed following injury. Elapse of time is seldom if ever a contra-indication for nerve suture. The most common deterrent is the joint fixation, contracture and atrophy of disuse and neglect. It should be emphasized that it is not so difficult to restore nerve function as it is to restore atrophic and contracted muscles and joints.

In June, 1936, this boy fell and cut his leg on an empty bottle, lacerating the tibialis anticus and the peroneal muscles, at the same time severing the common peroneal nerve. At that time this was not recognized; the wound was sutured, and because the foot dropped, the patient was told to push his foot up against a box until the wound healed. Unfortunately, the foot dropped persistently until he had the typical picture of peroneal nerve section. He walked with a complete foot drop. Together with this, of course, he had anaesthesia of the dorsum of the foot and anterior surface of the leg, and at the time I saw him he was beginning to develop contracture of the unopposed calf muscles.

In January, 1937, the peroneal nerve was exposed and sutured and the foot was supported in a posterior molded splint. Several weeks following this, the splint was replaced with a simple supporting brace to his foot. At about the end of four or five months, restoration of nerve function commenced. Since that time the brace has been gradually dispensed with until at the present time he walks and runs without any support whatever. He has complete return of sensation, complete return of contractility of his tibialis and peroneal muscles, and normal function of the leg and foot.

The difficulty in this instance was not in suturing his nerve or in obtaining restoration of nerve function, but in combatting the beginning contracture of the calf muscles.

Discussion

Dr. J. C. MCKINLEY: Dr. Zierold is to be complimented on his excellent result with nerve suture. The peroneal nerve, from an anatomical standpoint, would be expected to show its best results with lesions around the knee joint. If one studies cross sections of this nerve at different levels, one finds in the thigh that the nerve is made up of numerous fasciculi, probably 15 to 20 in the cross section. At the knee joint there are only two or three main fasciculi; one would thus expect that with nerve suture at that level, there should be a better chance for regenerating fibers to find their way into the distal segment than would be the case higher up where there are more fasciculi and relatively more connective tissue.

As Dr. Zierold says, a long time may elapse after injury before nerve suture and yet, on suture the individual may have good restitution of function. I once asked Dr. Ottfried Foerster whose experience with nerve injuries in the Great War was extraordinarily extensive, about his observations in this regard. He told me he had one case which had existed ten years after injury with total nerve section before suture, and the patient recovered his lost function very satisfactorily. A good many of us do not realize that muscle fibers may remain viable after denervation over such a long period of time.

L. B. BOIES,

Secretary.

NOTICE

The proceedings of the Seventh Biennial Conference, Health Section, World Federation of Education Associations, held in Japan, August, 1937, is now available.

The 37 papers, prepared by representatives of 17 countries, deal with the broad phases of HEALTH EDUCATION, HEALTH SERVICES, and PHYSICAL EDUCATION, with particular emphasis on rural problems.

This 258-page Report can be ordered for \$1.00, including postage, from the HEALTH SECTION SECRETARIAT, World Federation of Education Associations, 200 Fifth Avenue, New York City, New York.

Future Meetings

PROGRAM OF THE SOUTH DAKOTA STATE MEDICAL ASSOCIATION

57th Annual Session, Huron,
Marvin Hewitt Hotel
May 9, 10, 11, 1938

Monday, May 9, 1938

- 4 p. m. First meeting of the Council.
7 p. m. First meeting of the House of Delegates.

Tuesday, May 10, 1938

- 8:30—9:30 Obstetric Clinic, Dr. E. D. Plass, professor of obstetrics and gynecology, University of Iowa, Iowa City, Iowa.
9:30—10:30 Dermatological Clinic, Dr. H. E. Michelson, professor of dermatology and syphilology, and director of division, University of Minnesota Medical School, Minneapolis, Minnesota.

INTERMISSION

- 11:00—12:00 Medical Clinic, Dr. S. Marx White, professor of medicine, University of Minnesota Medical School, chief of department of medicine, Nicollet Clinic, Minneapolis, Minnesota.

NOON

- 1:20—1:40 Address, Dr. E. A. Pittenger, president, South Dakota State Medical Association.
1:40—2:10 "Obstetric Syphilis," Dr. E. D. Plass, Iowa City, Iowa.
2:10—2:40 "The Doctor in Health Education," Dr. W. W. Bauer, director, bureau of health and public instruction, American Medical Association, associate editor, *Hygeia*, Chicago, Illinois.
2:40—3:10 "Dermatological Diagnosis for the General Practitioner," Dr. H. E. Michelson, Minneapolis, Minnesota.
3:30—4:00 "The Corotid Sinus; Its Use in Diagnosis and in the Treatment of Paroxysmal Tachycardia," Dr. S. Marx White, Minneapolis, Minnesota.
4:00—4:30 "The Relation of Tears to Some Common Eye Diseases," Dr. C. Wilbur Rucker, assistant professor of ophthalmology, Mayo Foundation, Rochester, Minnesota.
6:15 p. m. Annual Banquet.
8:15 p. m. Public Meeting—"Popular Beliefs That Are Not So," Dr. W. W. Bauer, Chicago, Illinois.
10:00 p. m. Second meeting of the House of Delegates. Address by the president-elect, Dr. J. F. D. Cook, Langford, South Dakota.

Wednesday, May 11, 1938

- 6:30 a. m. Second meeting of the Council.
8:30—9:30 Rectal Clinic. Dr. Walter Fansler, clinical associate professor of surgery, University of Minnesota Medical School, head of proctologic clinic, Minneapolis General Hospital, Minneapolis, Minnesota.
9:30—10:30 Surgical Clinic. Dr. Virgil S. Counseller, associate professor of surgery, University of Minnesota Medical School, Mayo Foundation, Rochester, Minnesota.

INTERMISSION

- 11:00—12:00 Pediatric Clinic. Dr. H. F. Helmholtz, professor of pediatrics, University of Minnesota Graduate School of Medicine, head of the department of pediatrics, Mayo Clinic, Rochester, Minnesota.

NOON

- 1:30—2:00 "Diagnosis and Office Treatment of Rectal Diseases," Dr. Walter Fansler.
2:00—2:30 "The Physiology of Hypertension," H. M. Sweeney, Ph.D., professor of physiology, University of South Dakota School of Medicine, Vermillion, South Dakota.
2:30—3:00 "The Uterus as a Surgical Problem in General Practice," Dr. Virgil S. Counseller, Rochester, Minnesota.

INTERMISSION

- 3:20—3:50 "The Value of the X-ray in Diagnosis," Dr. Charles G. Sutherland, associate in roentgenology, Mayo Foundation, associate professor of radiology, University of Minnesota Graduate School of Medicine, Rochester, Minnesota.
3:50—4:20 "Recent Advances in the Treatment of Urinary Infections in Childhood," Dr. H. F. Helmholtz, Rochester, Minnesota.
4:20 p. m. Conference on roentgenologic diagnosis. Films to be furnished by members of the association. Dr. Charles G. Sutherland, Rochester, Minnesota.

South Dakota Academy of Ophthalmology and Otolaryngology

May 10, 1938

- 9:00 a. m. Dr. J. D. Alway, Aberdeen, South Dakota: "Foreign Proteins in Eye Therapy."
10:00 a. m. Dr. G. M. Constans, Bismarck, North Dakota: "Management of Squint."
11:00 a. m. Dr. L. R. Boies, Minneapolis, Minnesota: "The Modern Use of Peroral Endoscopy."
12:00 a. m. Dr. C. W. Rucker, Rochester, Minnesota: "The Visual Pathways."

PROGRAM OF THE NORTH DAKOTA STATE MEDICAL ASSOCIATION

51st Annual Convention, Bismarck,
World War Memorial Building

May 16, 17, 18, 1938

Monday, May 16, 1938

- 10:30 a. m. First call of House of Delegates.

Tuesday, May 17, 1938

General Assembly—

- 8:00 a. m. Registration in Exhibit Hall.
8:30 Opening.
Addresses of Welcome.
Response and Presidential Address, E. L. Goss, M.D., President, North Dakota State Medical Association.
9:00—10:15 Clinic, "Infant Feeding," Prof. F. W. Schlutz, M.D., chairman, department of pediatrics, University of Chicago.

- 10:15-10:45 View Exhibits.
- 10:45-12:00 Analysis of Obstetrical Cases, William F. Mengert, M.D., department of obstetrics and gynecology, University of Iowa.
- 2:40-3:40 Symposium in Pediatrics, "Prevalence of Deficiency Diseases," Prof. F. W. Schlutz, M.D., chairman, department of pediatrics, University of Chicago.
Discussion: Vitamin A. Deficiency, Ralph Pray, M.D., Fargo; Vitamin B Deficiency, J. L. Conrad, M.D., Jamestown; Vitamin D Deficiency, P. H. Woutat, M.D., Grand Forks.
- 3:40-4:00 View Exhibits.
- 4:00-5:00 Lecture, "Some Useful Prescriptions," Bernard Fantus, M.D., department of pharmacology, University of Illinois.
- 7:00 Annual Banquet. Silver Ballroom, Patterson Hotel.

Special Assembly—

ACADEMY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

- 12:00 Noon Luncheon. Prince Hotel.
- 1:30 (In Dining Room, Memorial Building).
 "Some of the Ocular, Otological and Rhinological Symptoms of Brain Tumor," Ernest Sachs, M.D., professor of clinical neurological surgery, Washington University, St. Louis.
- 2:00 Discussion.
- 2:30 "Tumors of the Larynx with Motion Pictures," Fred A. Figi, M.D., Rochester, Minnesota.
 Case Reports.
 Business Session.

Wednesday, May 18, 1938

General Assembly—

- 9:00-9:15 "Pulmonary Embolism," Paul J. Breslich, M.D., a. m. Minot, North Dakota.
- 9:15-9:20 Discussion.
- 9:20-10:10 Symposium, "Puerperal Sepsis," W. F. Mengert, M.D., department of obstetrics and gynecology, University of Iowa.
- 10:10-10:25 "Ectopic Pregnancy," C. D. Owens, M.D., Devils Lake, North Dakota.
- 10:25-10:30 Discussion.
- 10:30-11:00 View Exhibits.
- 11:00-12:15 Preview of Motion Picture, "Birth of the Baby," Bismarck Theatre.
- 1:45-2:00 "Medical Relief in North Dakota," E. A. Wilson, Bismarck, North Dakota.
- 2:00-2:30 "Head Injuries," Ernest Sachs, M.D., professor of clinical neurological surgery, Washington University.
- 2:30-3:00 "The Diagnosis of Acute Abdominal Conditions," R. W. McNealy, M.D., associate professor of surgery, Northwestern University.
- 3:00-3:30 "Problems in the Diagnosis and Treatment of Cholecystic Disease," Albert M. Snell, M.D., Rochester, Minnesota.
- 3:30 Drawing for Prizes.

Special Assembly—

- 9:20-10:05 "Recent Studies on Obstructive Jaundice and Its Complications," Albert M. Snell, M.D., Rochester, Minnesota.
- 10:05-10:50 "Management of Blood Vessel Injuries and Their Sequela," R. W. McNealy, M.D., associate professor of surgery, Northwestern University.

News Items

The new Budd Hospital at Roseau, Minn., was opened on March 8, 1938.

Dr. Jerome Scanlan of Minneapolis is now associated with Dr. A. K. Stratte of Pine City, Minn.

Dr. O. J. Hagen, Moorhead and Fargo, attended the regional congress of the American College of Surgeons which met in Milwaukee recently.

The golden anniversary of the Presbyterian Church of Langdon, N. D., was in part a celebration to honor Dr. William Wright McQueen, of that city, who began practice in North Dakota in 1894, settling in Milton. He has lived at Langdon since 1903, and is now 75 years old.

Dr. George H. Spielman, Mandan, has been renamed secretary of the Oliver County Board of Health in North Dakota.

Dr. Carl W. Laymon, assistant professor of dermatology in the University of Minnesota Medical School, Minneapolis, addressed the monthly dinner meeting of the Grand Forks District Medical Society of North Dakota on "Pre-Cancerous Skin Lesions" on February 23, 1938. Dr. C. J. Glaspel, president, presided.

Dr. Philip T. Y. Ch'iu, of the Peiping Union Medical College in China, has been granted a fellowship for a year's study in the United States. He is spending the first six months of this period in tuberculosis work in Minnesota. Dr. Ch'iu has devoted his time to tuberculosis for several years, and when he returns to China he will be in charge of work at the Peiping Tuberculosis Center.

Miss Helen Murphy, Phillipsburg, Montana, will be the new public health nurse for Silver Bow County, according to Dr. J. L. Mondloch, Butte, county physician. Miss Murphy, who holds a certificate in public health nursing from the University of Washington, is being paid by the Butte Junior League and the Montana State Board of Health.

Dr. Clyde E. Stackhouse, Bismarck, has been named medical referee of the North Dakota State Board of Public Welfare. He succeeds Dr. William H. Bodensab, of Bismarck.

Dr. Edgar H. Norris, Minneapolis, teaching assistant in the department of pathology of the University of Minnesota Medical School, has been named professor and chief of the department of pathology in the Wayne University College of Medicine, Detroit, Michigan. His tenure begins next fall.

Dr. Edythe Paulin Hershey, of the children's bureau of the United States Public Health Service, will succeed Dr. Jesse M. Bierman, director of the division of child welfare of Montana. Dr. Hershey has been with the Texas State Department of Health, and was graduated from the University of Texas Medical School in 1928.

Dr. Frederick N. S. Solsem, Bird Island, Minn., a graduate of the old Bennett College of Eclectic Medicine and Surgery in Chicago in 1906, has sold his practice to Dr. R. Erickson, a graduate of the University of Minnesota Medical School. Dr. Solsem will take graduate work at the University of Colorado.

Dr. Vernon J. Telford, a graduate of the University of Minnesota Medical School in 1930, has returned to Litchfield, Minn., after some time spent at Denver in surgical work at the University of Colorado. He plans to return to postgraduate studies in the University of Minnesota.

Dr. Marcus Hanna Flinter, of the United States Indian Service, has been designated senior physician of the medical services of the Cass Lake Consolidated Chippewa Indian Agency in Minnesota. Dr. Arthur Leon Picard has been made field physician; and Dr. Albion Pressman, working under Dr. Flinter, will be in charge of the White Earth area of the agency.

Dr. Benjamin Henry Brunkow, of the Smith Clinic in Glasgow, Montana, has associated with the Movius-Bridenbaugh Clinic in Billings. He is a graduate of the University of Wisconsin Medical School, class of 1932.

Eleven physicians have been named examining ophthalmologists to the department of social security of South Dakota, according to Mr. J. W. Kaye, Pierre, state director. They are: Dr. Guy F. Zarbaugh, Deadwood; Dr. Frederick C. Nilsson, Sioux Falls; Dr. Douglas Alway, Aberdeen; Dr. Edward A. Rudolph, Aberdeen; Dr. Howard Lee Saylor, Huron; Dr. Marceda Ligouri Spain, Hot Springs; Dr. Harley D. Newby and Dr. Frank W. Stevenson, Rapid City; Dr. Ray A. Kelly, Dr. Donald Roy Mabec, and Dr. Oscar J. Mabec, Mitchell.

Dr. Thomas L. Hawkins, Helena, secretary of the Medical Association of Montana, spoke before captains of District No. 4, Women's Field Army of the American Society for the Control of Cancer, in the Baxter Hotel at Bozeman on February 25, 1938.

Dr. John Raymond Kleyla, associate professor of medicine in the Creighton University School of Medicine, Omaha, spoke on "Recent Advances in the Treatment of Lobar Pneumonia" at the regular March meeting of the Seventh District Medical Society of South Dakota, at Sioux Falls on March 8, 1938. Dr. B. A. Dyar, Pierre, assistant state director of health, and Dr. E. A. Pittenger, Aberdeen, president of the South Dakota State Medical Association, were announced as speakers for the society's special session on March 29.

Dr. Roger Anderson, Seattle, Washington, addressed the March meeting of the Silver Bow County Medical Society of Montana, speaking on "The Ambulatory Treatment of Fractures of the Lower Extremities." Dr. H. H. James, Butte, president of the society, was the presiding officer.

Dr. Creighton Pemberton Farnsworth, Canova, S. D., was married to Miss Daisy Belle Bishop, of Canova, on February 11, 1938. Mrs. Farnsworth assists Dr. Farnsworth at the Canova Hospital, which he owns.

Dr. George R. Dunn, assistant professor of surgery in the University of Minnesota Medical School, was elected president of the Minneapolis Surgical Society on March 3, 1938, succeeding Dr. Otto Yoerg. Dr. Thomas J. Kinsella, assistant professor of surgery, was named vice-president; and Dr. Harvey Nelson was re-elected secretary-treasurer. Dr. Roscoe C. Webb, assistant professor of surgery, was named to the board of directors.

The Minnesota Pathological Society met in the Institute of Anatomy at the University of Minnesota on March 15 to hear Dr. A. B. Baker, instructor in nervous and mental diseases, speak on "Subdural Hematoma." Dr. Arild E. Hansen, associate professor of pediatrics, Dr. Irvine McQuarrie, chief of the department of pediatrics, and Dr. Mildred R. Ziegler, assistant professor of pediatrics, presented "Disturbances in the Osseous and Lipoid Metabolism in a Child with Primary Carcinoma of the Liver."

Dr. Robert Edward Fallis, Chicago, a graduate of the Northwestern University Medical School in 1935, has been named resident physician of Yellowstone Park, with headquarters at Mammoth, Montana. Dr. Paul Louis Gailmard, preceding resident physician, will resume practice in Los Angeles.

Dr. J. R. Pence, Minot, has been appointed health officer for Ward County in North Dakota.

Dr. Edmund Stephen Donohue, Gregory, S. D., a graduate of the Creighton University School of Medicine, Omaha, in 1933, has been named superintendent of the Gregory County Board of Health.

The Red River Valley Medical Society auxiliary has elected the following new officers: Mrs. Baldwin Borreson, of Thief River Falls, president, Mrs. S. H. Stuurmans of Erskine, secretary, and Mrs. C. L. Oppegaard of Crookston, treasurer.

The Lutheran Hospital of Hot Springs, S. D., has installed \$12,000 worth of new equipment, including a swimming pool for the treatment of patients with poliomyelitis.

Dr. Hamilton Montgomery, Rochester, associate professor of dermatology in the University of Minnesota Graduate School of Medicine, was elected president of the Chicago Dermatological Society recently.

Harry Darling, D.D.S., of Aberdeen, S. D., announces that enough money has been collected by the 40 et 8 Society of the American Legion to purchase two more Drinker respirators for South Dakota. One is installed in Deadwood; the second will be located in Aberdeen; the third will be housed at Mitchell. All will be under the control of physicians or hospitals.

The new Indian sanatorium at Rapid City, South Dakota, costing \$272,000, was turned over to the Federal Government on November first for operation by the contractors. It is a 3-story building, with 150 rooms and space for 114 beds. Nurses' headquarters have 40 rooms; the nurses' building was remodeled from the old boys' dormitory at a cost of \$39,000.

Dr. Russell M. Wilder, chief of the division of medicine in the Mayo Clinic, Rochester, and professor of medicine in the University of Minnesota Graduate School of Medicine, gave the 3rd address of the Sigma Xi series on "Fads, Fancies and Fallacies in Adult Diet" in Northrop Memorial Auditorium, University of Minnesota, on February 18, 1938.

Dr. Edgar Allen Pray, Valley City, was re-elected president of the North Dakota Anti-Tuberculosis Association at the 29th annual meeting of the organization at Bismarck. Dr. James Grassick, Grand Forks, was named honorary president; Dr. Victor J. La Rose, Bismarck, was chosen treasurer; and Dr. Fannie Dunn Quain, Bismarck, was elected recording secretary.

New officers of the Kotana Medical Society, as reported by Dr. A. W. Skelsey, secretary of the North Dakota State Medical Association, are: Dr. Ira S. Ab Planalp, Williston, president; Dr. Elmer J. S. Schwinghamer, Grenora, vice-president; and Dr. John Patrick Craven, Williston, secretary-treasurer.

The Sioux Valley Academy of Ophthalmology and Otology has Dr. Ray A. Kelly, Mitchell, S. D., as its new president. Dr. Frank L. Secoy, Sioux City, Iowa, is the new vice-president; and Dr. Jay C. Decker, also of Sioux City, is the secretary-treasurer. Dr. Delbert Kenneth Judd, Omaha, was named censor.

Dr. Clarence Edward Robbins, Pierre, has been appointed consulting ophthalmologist to the South Dakota state social security program, according to Mr. J. W. Kaye, Pierre, social security director. The work will be in connection with the needy blind of the state.

Dr. Andrew Thomas Cole, of the medical staff of the South Dakota State Sanatorium for Tuberculosis at Sanator, has resigned to become superintendent of the Champaign County Tuberculosis Hospital, Urbana, Illinois. His place will be filled by Dr. Jose Roberto Vivas, of Rio Piedras, San Juan, Porto Rico, a graduate of the Medical College of Virginia (Richmond) in 1934.

Dr. James A. Johnson, associate professor of surgery in the University of Minnesota, is the new medical director of the Nicollet Clinic in Minneapolis. Dr. James B. Carey, assistant professor of medicine, was re-elected secretary. Dr. S. Marx White, professor of medicine, and Dr. Hugo O. Altnow are the new directors.

Dr. Arthur Joseph Wheeler, Albuquerque, New Mexico, a graduate of the George Washington University School of Medicine in 1908, is the superintendent of the new \$272,000 Sioux Sanatorium west of Rapid City in South Dakota. Dr. Wheeler arrived in February.

Dr. William Alexander McMahon, Butte, Montana, a graduate of St. Louis University School of Medicine in 1934, has gone to Europe to study in Budapest and Vienna.

Dr. Francis Weldon Ford, a graduate of the Tufts College Medical School, Boston, has assumed the practice of Dr. Charles J. McGurren, Devil's Lake, N. D., who is ill. Dr. Ford has been at Minnewaukan for the past 18 months.

There is one physician for every 400 people in urban North Dakota, and one physician for every 800 people in rural North Dakota, according to a report by the Rockefeller Foundation under the direction of Platt Walker Covington, M.D., fellow of the foundation. Oliver and Sioux Counties are without physicians; and Billings and McKenzie Counties have one physician each to care for the medical needs of more than 20,000 people.

Dr. J. P. Aylen, Grafton, N. D., will practice general medicine in Fargo. He had lived in Fargo until 1914, at which time he went to Grafton.

Dr. A. Louis Arends, Askov, Minn., will remove to Sandstone, where he has purchased a building.

Dr. William von Rohr Heise, a graduate of the Northwestern University Medical School and recently of Children's Memorial Hospital in Chicago, has begun practice in Winona, Minn.

The Silver Bow County Hospital in Butte, Montana, now has an oxygen catheter, the gift of the Butte Junior Service League.

Dr. Thomas B. Magath, Rochester, Minn., professor of parasitology in the University of Minnesota Graduate School of Medicine, has gone on an explorative venture into Southern Mexico in search of specimens of a parasite which invades the human body and eventually invokes blindness.

A \$20,000 hospital of 15-bed capacity will be erected in Watford City, N. D., the work of excavating for the basement having begun on February 1 under WPA labor.

Dr. Raymond P. Frink, Wagner, S. D., a graduate of the Northwestern University Medical School in 1903, has moved to Wessington Springs, to take the place of Dr. Jesse W. Foster, who has gone to Ankeny, Iowa.

Dr. Oscar Howard Clark, Newell, S. D., a graduate of the old Lincoln Medical College (Eclectic) of Nebraska in 1908, was indicted by the Federal grand jury at Aberdeen recently, charged with the sale of narcotics in violation of the Federal statute. Two years ago he pleaded guilty to a similar charge, and was placed on probation.

Dr. Oliver Simmons Craise, Towner, N. D., has been named superintendent of the McHenry County Board of Health.

The St. Louis Clinical Society offers a period of training for medical reserve officers at present on inactive duty, from May 23 to 28 in St. Louis, Missouri. The fee of \$10.00 for enrollment need not be paid by reserve officers, but a fee of \$2.50 will be charged reserve officers for incidental expenses. Military credits will be given for attendance. All interested medical reserve officers of the 7th Corps Area should write to Colonel Kent Nelson, M.D., Office of the Surgeon, Seventh Corps Area Headquarters, Omaha, Nebraska.

The town of Marshall, Minn., now has a city hospital with a staff of four nurses. The hospital is operated by Dr. Abe Wilbur Cowin.

The Seventh District Medical Auxiliary gave a dinner at the Cataract Hotel in Sioux Falls, S. D., to emphasize "Doctor's Day" in Sioux Falls. Presiding officer was Mrs. F. C. Nilsson, the newly-elected president of the auxiliary. Speakers were Mrs. N. J. Nessa, Sioux Falls; Dr. J. G. Billion, Dr. D. W. Craig, Dr. W. P. Roberts, Dr. C. F. Culver, Dr. E. E. Gaye, and Dr. E. L. Perkins. Mrs. George W. Burnside and Mrs. Samuel A. Brown, Sioux Falls, were guests of honor.

Dr. Carl D. Kolset who has practiced medicine for a number of years in Sanborn, Minn., has retired from active practice. Dr. Kolset, who had practiced medicine for over 33 years, retired because of ill health.

Dr. Paul Reed, formerly of Langdon, N. D., has taken charge of the Municipal Hospital at Rolette, N. D.

The new president of the Silver Bow County Medical Society of Montana is Dr. Herbert H. James, of the Murray Hospital staff in Butte. Dr. Robert Gray Kroeze, Butte, is vice president; Dr. Spies V. Wilking, Butte, is secretary; Dr. Ashley W. Morse, Butte, is treasurer; and the trustees are: Drs. Raymond F. Peterson, Robert Gray Kroeze, Herbert H. James, McCormick Smetters, and Ashley W. Morse.

Dr. Harrison R. Wesson of Lawrenceville, Va., has joined the staff of the Garberson Clinic of Miles City, Montana, in the surgical division. A graduate of the Medical College of the University of Virginia, Dr. Wesson has been associated with the Mayo Clinic, the Dollar Steamship Line as ship surgeon, and the Virginia Mason Hospital in Seattle, Wash.

Dr. B. A. Dyar, Pierre, assistant director of the South Dakota Department of Health, and medical supervisor for the Farmers' Aid Corporation of that state, announced that the Corporation will provide medical care for from 70,000 to 80,000 rural residents whose families have standard loans or grants from the Farm Security Administration. Members of the South Dakota State Medical Association have already voted to handle these cases at set fees. Dr. Dyar emphasizes the fact that only emergency cases may be treated thus; not old, chronic ailments. There is about \$350,000 available for South Dakota for this purpose.

The Mississippi Valley Medical Society offers a cash prize of \$100.00, a gold medal, and a certificate of award for the best unpublished essay on a subject of interest and practical value to the general practitioner of medicine. Entrants must be licensed, ethical physicians, residents of the United States, and graduates of approved medical schools. The winner will be invited to present his contribution before the next annual meeting of the Mississippi Valley Medical Society (September 28, 29, 30, 1938). Contributions must not exceed 5,000 words, must be typewritten in manuscript form, submitted in 5 copies, and received not later than May 15, 1938. Details may be obtained from Harold Swanberg, M.D., 209-224 W. C. U. Building, Quincy, Illinois, secretary of the society.

Cecil C. Hurin, Beverly Hills, Calif., has been selected as superintendent of the Black Hills Methodist Hospital, Rapid City, S. D. Mr. Hurin has been in charge of several large hospitals in the West and Middle West and comes direct from the Methodist Hospital of Southern California at Los Angeles, where he had been superintendent for the past three years.

Necrology

Dr. Frank L. Watkins, 58, died April 7th. Dr. Watkins was City-County Health Officer for the past eight years in Great Falls, Montana. He was born in 1879 and received his medical training at the Ohio Medical University, now Ohio University.

Dr. George Atwood Pettigrew, 80, retired surgeon and banker, died in his office at Willmar, Minn., April 1st. Dr. Pettigrew retired from medical practice in the prime of his life to devote his time to fostering the work of Masonic bodies with which he was allied. It was said that not more than half a dozen other men in the world had a more notable Masonic record.

Dr. C. M. Golden, Tyler, Minn., died March 25 at the age of 61.

Dr. John Roy Mackenzie, 58, of New Rockford, N. D., a practicing physician in North Dakota for many years, died at Asbury Hospital in Minneapolis on April 10, 1938. He was graduated from the Wayne University College of Medicine in Detroit in 1906.

Dr. Frank L. Watkins, 59, for the past eight years health officer for Cascade County in Montana, died at Great Falls on April 7, 1938, of pneumonia. He was a graduate of the old Ohio Medical University, Columbus, in 1901; and established the first bureau of vital statistics for that state.

Dr. Ira McConaughy Roadman, 73, a graduate of the University of Minnesota Medical School in 1898, died on February 14, 1938, at Mexico City, Mexico, seven days after an emergency appendectomy at the English Hospital in that city. He was a resident of St. Paul.

Dr. Charles Joseph McGurran, 65, of Devil's Lake, N. D., a pioneer physician of territorial days, died in that city in March. He had been a colonel on the staffs of five North Dakota governors, and was superintendent of the North Dakota State Board of Health for eight years. He was graduated from the University of Minnesota Medical School in 1904, and came to Devil's Lake in 1909.

Dr. Frederick Herrick Aldrich, 66, a resident of Belview, Minn., for 35 years, died at his home on March 17, 1938. A captain in the medical corps during the World War, Dr. Aldrich was graduated from the University of Illinois College of Medicine in 1902, and had served as mayor, coroner, and district representative for Redwood County.

Minneapolis, Minnesota
June, 1938

Vol. LVIII, No. 6
New Series

Combined Uterotubal Insufflation and Hysterosalpingography

An Office Method

Claude J. Ehrenberg, M.D.†

Minneapolis, Minnesota

SINCE the introduction of uterotubal insufflation by Rubin in 1920, and hysterosalpingography by Hensen in 1921, many modifications of both techniques have been devised and described. These tests have generally been accepted as being without danger and as being necessary to the study of female infertility. Since simplicity is desirable, an easily performed method for each procedure will be described. Eight years of experience has shown these methods to be satisfactory.

The first is an obscure method for uterotubal insufflation described by Dickinson in 1922. The second is a simple method for performing lipiodol hysterosalpingography. The latter has been used only as an adjunct to uterotubal insufflation because lipiodol is, after all, a foreign body which remains in the cavities of the uterus, the uterine tubes and the abdomen for long periods of time. However, when uterotubal insufflation has been unsuccessful, there has been no hesitation in using lipiodol because its value is twofold: (1) in demonstrating patency of the fallopian tubes in those few cases in which spasm prevents passage of air; (2) in demonstrating the point of obstruction in blocked uterine tubes. The latter

is of importance since the indication for surgery usually can be predicated only on the proximity of the obstruction to the fimbriated end of the uterine tube.

Contra-indications to both of these tests, while well-known, may be worth repeating: (1) when inflammation exists in the genital tract, particularly in the cervix uteri; (2) in women who have a severe systemic disturbance forbidding pregnancy; (3) in women whose husbands have aspermia.

The use of the Dickinson apparatus is subject to the conditions for uterotubal insufflation imposed by Rubin. First, the test should be performed from three to seven days postmenstrual. Second, pressures should not be elevated to over 200 millimeters of mercury. Third, the amounts of insufflated gas, which in this test is air, should be as small as possible; usually less than 100 cubic centimeters.

The apparatus for the Dickinson uterotubal insufflation consists of a glass cannula shaped like the Keyes-Ultzmann metal cannula, a glass T-tube, a manometer, a rubber bulb of 30 cubic centimeter capacity, and sufficient rubber tubing. The technic for using the Dickinson apparatus is as follows. The instruments used, and

† Instructor, obstetrics and gynecology, University of Minnesota Medical School.

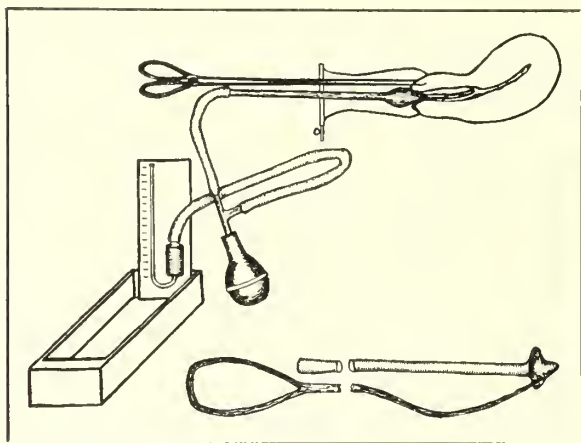


Fig. 1. Dickinson Apparatus assembled and in place. Method for applying introducer into catheter head.

the apparatus including the glass cannula and T-tube, the rubber bulb and the rubber tubing are sterilized by boiling. With the patient in a dorsal position, the cervix uteri is exposed through a speculum. The cervix uteri and the vault of the vagina are cleansed and painted with 2 per cent aqueous solution of mercurochrome. The cervix uteri is grasped transversely on the anterior lip with a single tenaculum forceps. The rubber tubing from the T-tube is attached to a Tycos sphygmomanometer or, preferably, to the Baumanometer as the mercury readings are more accurate. The cannula is introduced into the uterine cervical canal until the glass bulb rests against the external os. While an assistant holds the cervix uteri steady with the tenaculum, the operator holds the glass bulb of the cannula tightly against the external os, with the left hand. The right hand then manipulates the rubber bulb to raise the pressure in the uterus, keeping the scale of the manometer constantly under observation.

As the rubber bulb has a capacity of 30 cubic centimeters, and as the circuit is closed except at the uterine tube ends, no more air than the bulb capacity can be injected into the abdominal cavity at any one trial. The transmission of air through the uterine tubes is determined by a drop in pressure on the manometer scale and is often accompanied by a swishing sound which seems to emit from the upper end of the vagina. Leakage of air at the external os is easily detected; but, if this offers any difficulty, bathing the glass bulb of the cannula with lubricating jelly will emphasize the leakage. The sound of air going through the uterine tubes may also be heard through a stethoscope with the bell placed over the tubal areas of the abdomen. Later, when the patient has assumed the upright position, evidence of air in the abdomen is manifested by supraclavicular pain caused by the intra-abdominal bubble of air rising to the subdiaphragmatic position. This pain, if severe, is relieved by putting the patient in the knee-chest position for a few



Fig. 2. Uterine tubes patent. (Note drop of lipiodol emitting from left tube end and collecting in pelvic cavity. Visible with fluoroscopy.)

moments. The pain may last as long as twenty-four hours.

The above test, quickly and easily performed, will usually demonstrate the presence or absence of tubal patency. If, after a number of trials, no air has passed through the tubes, the cannula is removed and set aside. A soft rubber mushroom catheter, size 14 to 18 French, is applied to the end of a long metal introducer through one of the holes in the head of the catheter. The catheter head is then introduced into the cervical canal and pushed into the cavity of the uterus. Occasionally this step may necessitate dilatation of the cervix uteri with Hegar dilators to the No. 5. The internal os offers a point of resistance, to overcome which a little firm pressure is necessary. This is attended with some pain. Entrance of the catheter head into the uterine cavity is marked by a sudden release of the resistance and an almost immediate relief of the pain. The introducer is then removed with a slight jerk. The tenaculum and speculum are removed and the open end of the catheter is allowed to hang out of the vagina. The patient is allowed to get up and, after a few moments' wait, walks to the X-ray room.

With 5 to 8 cubic centimeters of warm sterile lipiodol in readiness in a Luer syringe, the patient is placed on the horizontal fluoroscopic table. Under fluoroscopic visualization, the lipiodol is injected into the open end of the catheter, its progress being observed through the catheter, the uterus, uterine tubes, and into the abdominal cavity. When lipiodol is seen to drop from the fimbriated end of the uterine tube into the abdominal cavity, the injection is stopped and the catheter is clamped. If



Fig. 3. Uterine tubes occluded at distal end.

the lipiodol does not drop from the ends of the uterine tubes, slightly more pressure is put on the plunger of the syringe; and fluoroscopic observations are made at momentary intervals. If, after a few observations, no lipiodol is seen dropping from the uterine tube ends, the catheter is clamped and the syringe removed. In either case, stereoscopic X-ray films of the area are taken for later study. The catheter is removed and the patient is allowed to dress and go home.

Conclusion

The simple combined method of uterotubal insufflation and hysterosalpingography described here, is easily performed as a consultation office procedure.



Fig. 4. Uterine tubes occluded at proximal end. (Note: Catheter size too small, permitting regurgitation of lipiodol into vagina.)

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NOTE: I wish to acknowledge the helpful suggestions of Dr. Russell Morse, with whom the radiological work was done.

Peptic Erosions

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I WOULD include under the term Peptic Erosions all those cases previously reported as "Gastrorrhagia",¹ "Hemorrhagic Focal Duodenitis",² "Diffuse Hemorrhage from the Stomach",³ "Einhorn's Disease",⁴ "Dieulafoy's Ulcer",⁵ etc. This would simplify medical terminology in reporting cases, lead to a more comprehensive knowledge of the incidence and symptoms of the disease, stimulate research as to its etiology, pathology, diagnosis, and treatment; and I think the understanding gained would aid in our settlement of the peptic ulcer problem.

The term "Peptic" does not describe an anatomical part of the gastro-intestinal tract, but through common usage has come to be thought of as the stomach and first and second parts of the duodenum. This area seems to be the predominant region affected by erosions. An erosion is an eating or gnawing away, and describes more of a superficial loss of tissue. I, therefore, suggest the use of the term Peptic Erosion, to include those cases of erosions occurring in the peptic area, until the right and proper one is discovered.

Incidence

The true incidence is unknown, but it is probably relatively common. We have all seen patients with symptoms suggesting either uncomplicated peptic ulcer or ulcer with hemorrhage, in whom we could not by X-ray demonstrate a defect. The percentage of cases of dyspepsia or hematemesis due to peptic erosions is as yet unknown.

Etiology

Rivers² is, I think, the only one who has attacked the problem from the experimental standpoint and succeeded in producing lesions. He produced a duodenitis in rabbits by injection of cultures from various foci of infection in people with a duodenitis. He found that in the duodenal cases often a history of recent acute infection could be obtained. Bortz³ mentions as causative factors of gastric erosions: physical and emotional strains, chlorosis, catarrhal inflammation, postoperation, constipation, calcium deficiency and over-active vagus. Heredity⁴ and allergy⁵ have also been implicated.

Pathology

The pathology can only be demonstrated in the acute case²; the lesions are superficial and heal readily. In the acute case, one finds from a few to many (Einhorn's disease) multiple pin-point erosions, to one or several superficial mucosal defects up to about three and one-half centimeters in diameter. (Dieulafoy's ulcer). There may be some edema. In the chronic case there may be adhesions.

The lesions in the acute case are easily missed,³ as the mucosa only is involved, and often the erosion is near or on a relatively small ecchymotic area.

The relation to chronic hypertrophic gastritis is yet to be determined. Schindler⁶ states that this form of gastritis is often characterized by hemorrhages and erosions, and is recurrent. But it differs from the gastric erosions in being more common in males and in having gas and belching as prominent symptoms. Also, the mucosa does not revert to normal.

Symptoms

The disease usually occurs in patients from 20 to 40 years of age.³ The gastric lesions are more common in females than males (about 4 to 1).³ while the duodenal lesions in reported cases seem to predominate in males. The symptoms may be mild or severe; a patient may have one attack or many, with a varying time interval of freedom from symptoms up to 12 years or more. The symptoms in the uncomplicated case are those of dyspepsia, simulating peptic ulcer, only not as readily relieved by food or alkali,² and the nutrition remains relatively good.³

Complications

The main and only complication described so far is that of hemorrhage. This is the first symptom in many cases or at least the one that brings a call for the Doctor, as the previous evolution of the lesion is often relatively silent, so far as we now know. The symptoms usually cease after a hemorrhage.

Diagnosis

The diagnosis is made on the history, plus negative chemical and X-ray findings^{2,3} and is mainly by exclusion of other causes. With the development of the gastroscope⁶, we have a means for making a positive diagnosis in the gastric case; but the duodenal lesions are as yet undemonstrable in the living patient except on laparotomy.

Differential Diagnosis

Peptic erosions must be differentiated especially from peptic ulcer and from all the other causes of dyspepsia in the simple case; in the case complicated by hemorrhage, from all the other causes of hematemesis and occasionally melena.

Prognosis

The prognosis in uncomplicated cases is probably good; in hemorrhagic cases it is unknown, but there is danger to life.

Treatment

The treatment used and recommended has been varied, but is in the main, symptomatic. Rivers² secured good results in duodenal erosions by removing foci of infection and giving a bland high caloric diet. His work should be repeated. Gastro-enterostomy¹ and gastric resection¹ have produced relapses for varying periods of time or a cure. In the case complicated by hemorrhage, transfusion may be life saving and mocassin venom may be tried.⁴

Relation to Peptic Ulcer

Peptic erosions resemble peptic ulcer in that both diseases occur only in regions that are or may be bathed in secretions from the stomach or stomach tissue. Their sex incidence in gastric and duodenal cases and their symptomatology is similar.

It differs from peptic ulcer in that symptoms are not as readily relieved by food and alkali; the lesion only exists in the acute form; stomach chemistry and X-ray are normal; there is no associated inflammation;³ stomach ulcers are more common on the lesser curvature while erosions are more common in the fundus;³ erosions occur in people seemingly in good health and nutrition with long intervals between attacks.

Report of a Case

Patient — 41 year old white male of the Nordic race, single, laborer, now engaged in the garage business.

Present complaint: vomited blood, one quart, he stated, at 8:00 P. M., 10-28-36. Patient said that he was in good health until 36 hours previously when he began to have a burning pain in the epigastrium and some anorexia. This was continuous, unrelieved by food and soda, progressive in severity. The pain kept him awake about 4 hours (10-27) and at 3:00 in the morning he felt nauseated. Finally got to sleep about 4:00 A. M. Woke up with the pain in the morning, ate and walked around. At 5:00 P. M. he had another attack of nausea, did not eat much supper and at 8:00 P. M. vomited blood.

Past history: patient drank beer, wine, *etc.*, more or less continuously, three times a day, in small amounts. Occasionally he drank more. Twelve years ago patient had a similar attack. He became acutely ill with severe abdominal pain about 4:00 P. M. and vomited blood once about an hour later. A diagnosis of bleeding ulcer was made on the history; patient was hospitalized and treated with sippy diet for two weeks. He did not follow any diet after discharge from the hospital and denies any stomach trouble until the present. He has had no recent illness and his history otherwise seems negative.

Physical examination findings: A white male 5 feet 6 inches tall, weight 163 pounds, resting in bed but appearing to be in pain. Pulse 80. Good general condition. No signs of anemia. Tenderness in the epigastrium, no rigidity.

Impression: Acute perforating and bleeding peptic ulcer.

I advised hospitalization but patient refused, saying the other attack had been of little consequence. I gave him a hypodermic injection of a quarter grain of morphine and 1/100 grain of hyoscine, ordered an ice bag to his stomach and nothing by mouth. At 9:00 A. M. the next day patient said that he had not slept very much because of pain in his stomach. No more nausea or vomiting. Gave him another hypodermic as above.

At 11:30 A. M. patient had another hemorrhage and consented to go to the hospital. He showed signs of anemia, his nails were white and he was a little restless. Pulse was 100 and blood pressure 80/40. Subcutaneous fluids were given. Blood typing was refused by the patient. R.B.C. was 4 million, hemoglobin 80 per cent, and W.B.C. was 12,000. A blood smear revealed no evidence of a blood dyscrasia. Urine was negative. At 5:30 P. M. he had another hemorrhage. He was now quite restless and slightly irrational. Thromboplastin was given and the subcutaneous fluids were continued. Patient refused to be operated. At 8:30 P. M., he had another hematemesis; occupational delirium. Had blood typed but brother refused to be the donor. Pulse 120. B.P. 60/20. Very anemic.

At 1:45 the next morning (10-30-36) the patient died, about 66 hours after he first became ill and 30 hours after the first hemorrhage.

An autopsy was performed the same morning of death at 9:00 A. M. The essential findings were in the gastro-intestinal tract. The body was very anemic throughout. No adhesions were found in the abdomen. The lumens of the stomach and intestines were filled with blood. The mucosa of the entire genito-urinary tract was pale and creamy in color. About one inch

below the pylorus, in the duodenal mucosa on the lesser curvature side, adjacent to the head of the pancreas, began an area of multiple pin-point erosions about 1 by 1½ inches in diameter. There was a small area of purple ecchymosis about 3 mm. in diameter almost in the center of the erosions.

Three feet above the ileo-caecal valve was a diverticulum, 1 inch in circumference and 3 inches long, the mucosa of which appeared normal. The liver and spleen seemed normal. The gall bladder and appendix revealed no evidence of acute or chronic inflammation and appeared normal.

Pathological diagnosis (made at a later date) was: (1) peptic erosions of the duodenum which had produced death by bleeding; (2) Meckel's diverticulum.

Conclusion

The term Peptic Erosions is suggested to designate those acute, superficial, mucosal defects occurring in an area bathed by stomach juice. The main symptom is pain; the only complication and the cause of death is hemorrhage. Much is as yet unknown about the disease. A case of Duodenal Erosions with autopsy is presented.

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The Interpretation of Roentgenograms of Fractures of the Extremities

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THIS paper will be presented from the standpoint of the man in general practice who takes or interprets his own roentgenograms in fractures of the extremities. My aim in this presentation is to bring to your attention:

1. Some important points in the X-ray technic in the roentgenological study of fractures of the extremities.
2. A few of the more common errors in the interpretation of X-ray films of fractures of the extremities.

In the X-ray study of fractures of the extremities the following general rules should be observed:

1. Obtain technically good films by (a) using the correct exposure technic, (b) developing according to the

time-temperature method, (c) immobilizing the part so that there is no movement on the film to obscure a possible fracture line. It is very easy to miss a fracture line when the film is over- or under-exposed. By keeping a record of your exposure factors in all your cases for a short period of time, you will soon be able to work out an exposure chart so that your films will be uniformly correctly exposed. The films must also be developed correctly. Where one takes films infrequently, it is difficult to have the developer at the optimum temperature. By taking the temperature of your developer you can refer to a chart (furnished gladly by any of the film companies) which will give you the time for developing at that temperature (Fig. 1). The developing time has to be gradually increased from that shown on the chart, depending upon the number of films passed through the solution, and its age. By working out

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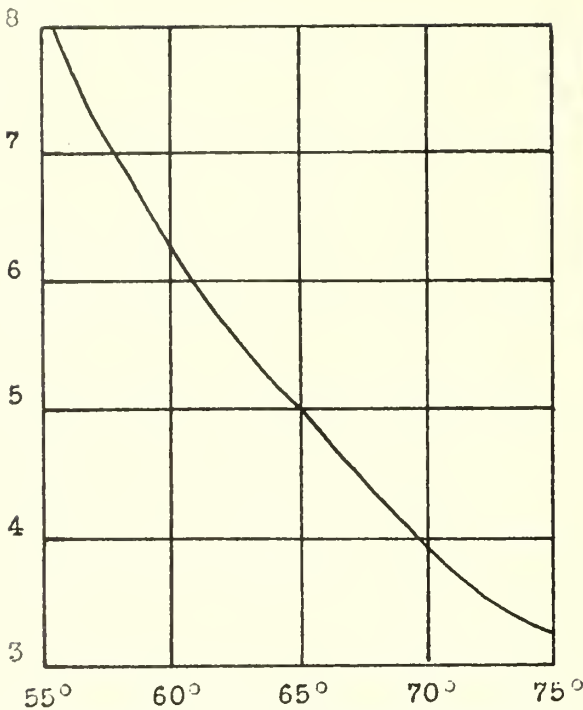


Fig. 1. This illustrates the time-temperature developing curve for one brand of developer and one type of film. Obtain the correct chart for the developer and film. The developing time has to be gradually increased, depending upon the number of films that have been passed through the solution.

the correct exposure technic and developing the proper time according to the temperature, you will obtain uniformly good films. Immobilization of the part is very important, as a fracture line is easily obscured by even a slight amount of movement. Sand bags applied above and below the part to be radiographed will save you many retakes and will assure you that you are not missing a fracture due to movement on the film.

2. Use standard anteroposterior and lateral views. Become familiar with the normal at the various ages in these standard positions. When in doubt as to the interpretation, it is frequently a great aid to make roentgenograms of the corresponding, normal extremity for comparison. This is especially true of the elbow in children.

3. Always take two views at right angles to each other. It is rarely safe to make a negative diagnosis on one view. Very frequently a view made in one plane will appear normal and a second view at right angles to the first will show a fracture. Additional views in an oblique projection are frequently of value. Stereoscopic views also are sometimes valuable. However, two views at right angles are much more accurate as to the position of the fragments of a fracture than stereoscopic views in one projection.

4. Re-ray after reduction. See that you have restored the normal, anatomical relationship of the bones. This is very important. Many men obtain poor results because they are not sufficiently familiar with the normal anatomy as shown on the roentgenogram. They misinterpret their films, so that they believe they have



Fig. 2. This shows how one can take two views of the humerus when it is put up at the side or in a triangular splint, each view being at right angles to the other.

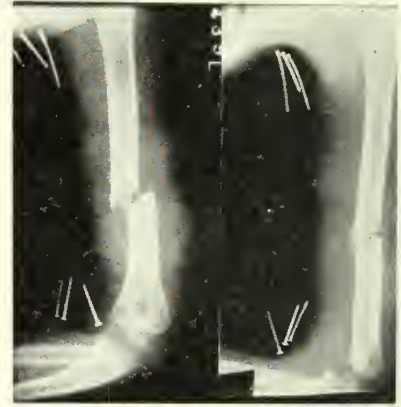


Fig. 3. Transverse fracture of the shaft of the humerus. On one view the position and alignment appear to be perfect, whereas on the other it shows that the ends are in apposition for only half their breadth. This position, in this type of fracture, will, of course, give a good result. These two views were made as shown in Fig. 2. It is perfectly possible for the one view to show that the ends are apparently in apposition, whereas the other view taken at right angles will show that the ends are not touching.



Fig. 4. How one can make a lateral view of the neck of the humerus when the arm is put up in extension or an aeroplane splint, is shown here. The film is placed on top of the shoulder and the rays are directed up through the axilla from below.

restored the correct, normal relationship, whereas the position is very poor. This is especially true of the distal end of the radius. Make occasional re-rays during convalescence so that you are positive that good position and alignment of the fragments are being maintained.

One must also be on the lookout for non-union. In non-union the following changes gradually become apparent on the roentgenogram. The fractured ends begin to be rounded off and the fractured surfaces become smoother. No callus is apparent across the fracture line. The space between the fractured ends may become slightly wider. One then begins to get a thin line of cortical bone laid down across the fractured surface. Most of the cases of non-union that I have seen have been of the tibia and the internal malleolus.

On the basis of these four general rules, I will present a few points on the technic and interpretation of the following:

- 1. Fractures of the upper end of the shaft and neck of the humerus.
- 2. Supracondylar fractures of the elbow.
- 3. Simple fractures of the neck of the radius in adults.
- 4. Fractures of the distal end of the radius.
- 5. Fractures of the upper end of the shaft and neck of the femur.
- 6. Fractures of the shaft of the tibia and fibula.
- 7. Fractures of the ankle.

Fractures of the upper part of the shaft and neck of the humerus.

- 1. One usually can make a negative diagnosis on a good anteroposterior view.
- 2. If a fracture is present, one must take two views at right angles in order to be sure that the fragments are in good position.

If the arm is put up in a triangular splint or at the side, one can take two oblique views at right angles to each other. Figures 2, 3.

If the arm is put up in extension or an aeroplane splint, one can take the usual anteroposterior view and then can make a lateral view, placing the film on top of the shoulder and directing the rays up through the axilla from below. Fig. 4. It is always possible to get two views of the upper end of the humerus at right angles to each other regardless of the position in which the arm is placed after reduction.

It is very easy to misbelieve that the position and alignment of a fracture of the neck of the humerus are excellent when one relies only on the anteroposterior view. Figures 5 and 7 show cases which, on the anteroposterior view, the position and alignment appear to be excellent; but the lateral view shows that the position and alignment are poor.

Fig. 5. Fracture of the neck of the humerus. The anteroposterior view (upper film) shows the position and alignment are apparently excellent. The lateral view (lower film) of the same case shows that the ends are not even in apposition. This case illustrates very well how one might be misled with only the one view. See Fig. 6.

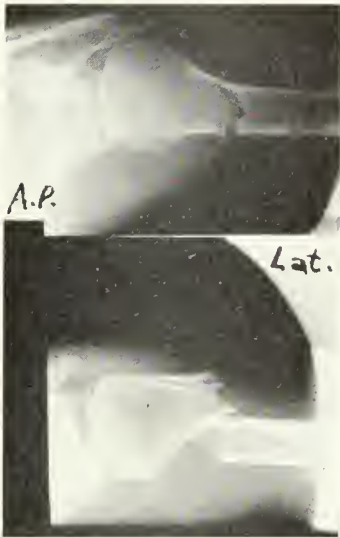


Fig. 6. Fracture of the humerus shown in Fig. 5 after manipulation. On both the anteroposterior view (upper film) and the lateral view (lower film) the position and alignment are shown to be excellent.

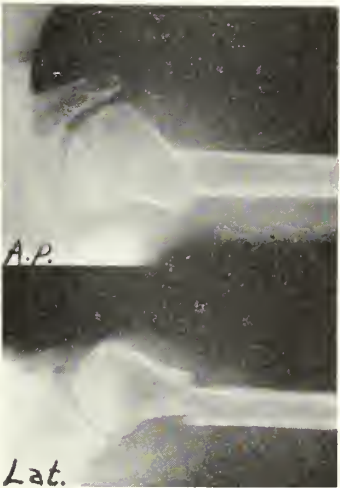


Fig. 7. Fracture of the neck of the humerus. The anteroposterior view (upper film) shows that the position and alignment are apparently very good. The lateral view (lower film) shows that there is too much posterior angulation at the point of fracture. The arm, in this case, was up in an aeroplane splint.



Supracondylar fractures of the elbow.

It is very important to take both anteroposterior and lateral views in order to detect a fracture, and one must have both views after reduction, if one is to be certain that the position and alignment are correct.

If the elbow is held at right angles by a spasm of the muscles, one usually can straighten this out to a 45-degree angle by slow, steady pressure, without much discomfort to the patient. One can then make a very good anteroposterior view by placing the arm and forearm at the same angle to the film. Fig. 8.

The multiple epiphyses of the elbow joint, especially in children, are very confusing. When in doubt as to the interpretation, make a view of the uninjured side for comparison. It is important to remember that the epiphysis of the capitellum, which is the main epiphysis and the first to appear, makes an angle of 135 to 145 degrees with the shaft. Fig. 9.

In supracondylar fractures which have been reduced and put up in acute flexion, one can get a good anteroposterior view for position by directing the rays through the upper end of the radius and ulna toward the supracondylar fracture line, angling slightly toward the shaft of the humerus. Fig. 10.

Figures 11, 12 and 13 show a supracondylar fracture before and after the first and second attempts at reduction. On the anteroposterior views after the first reduction, the position and alignment appear to be good; but the lateral view shows that the distal fragment is displaced laterally.

Figure 13 shows the same case after another attempt at reduction, and shows that the position and alignment are now excellent.

Fractures of the neck of the radius in adults.

1. This is the fracture most frequently missed on X-ray films by the man in general practice.

2. A good clinical symptom in this fracture is pain over the head of the radius on rotation of the forearm.

3. This is usually an impacted fracture, so one does not always see a frank fracture line. Occasionally, one sees a line of increased density due to the impaction of the fragments at the fracture line.

4. The important diagnostic point on the X-ray film is an alteration or break in the smooth curve usually seen in the neck of the radius. Normally, the neck of the radius forms a smooth, symmetrical curve. Fractures of the neck of the radius invariably show a break in the symmetry of this curve and when this smooth curve is interrupted, one must be on the lookout for a fracture of the neck. This point is well illustrated in Figures 14 and 15.

Fractures of the distal end of the radius and ulna.

This is the fracture most frequently seen by the man in general practice. Many poor results are obtained due to the improper interpretation of the films. This improper interpretation is due to a lack of appreciation of the normal anatomy of this joint as shown on the roentgenogram. On the normal wrist the distal end of the radius projects beyond the end of the ulna. Fig. 16.

The articular surface of the distal end of the radius points slightly anteriorly; so that a line drawn perpendicular to this articular surface will pass out through the posterior surface of the radius, two to three inches above the wrist joint. Figures 17, 18. In many cases of fractures of the distal end of the radius (Colles' type), upon casual examination of the films the position and alignment appear to be good and no reduction is apparently necessary. More careful study, however, shows that the distal fragment of the radius is angled posteriorly; a line projected perpendicular to the articular surface will pass out through the anterior surface of the shaft, instead of the posterior surface, two to three inches above the wrist joint as in the normal. Fig. 19.

In this type of fracture, in reduction one must be very careful to restore the normal, anatomical relationship. If, after reduction, the normal, anatomical relationship is not restored so that a line drawn perpendicular to the articular surface passes out through the posterior surface two to three inches above the wrist joint, one will invariably obtain a poor functional result and a painful wrist. This is very well demonstrated in the cases shown in Figures 20 and 21.

After this type of fracture has been properly reduced, it is usually necessary to put up the wrist in flexion and ulnar deviation in order to maintain this position during convalescence. Fig. 22. We have had several cases in which the position was correct after reduction, but in which the wrist was put up in a straight splint. Almost invariably during convalescence the distal end of the radius angled posteriorly, so that we obtained a poor functional result and a painful wrist. Possibly an explanation for this phenomenon may be that the extensor muscles exert more pull than the flexor group in this position and this may cause the distal end of the radius to angle posteriorly.

Fractures of the upper end of the shaft and neck of the femur.

1. It is possible to make a negative diagnosis from a good anteroposterior view.

2. If a fracture is present, one must have a lateral view to determine the position. It is always possible to get a lateral view with almost any X-ray machine even through a cast. Re-ray a number of times while under treatment, using both an anteroposterior and lateral view to check the position.

The lateral view can be made in several different ways. In our experience, the simplest and most satisfactory method has been to direct the rays from under or above the knee of the unaffected side. Place the cassette on the outside and above the hip of the affected side. Make a mark on the anterior superior spine of the ilium, another over the greater trochanter and a third over the symphysis pubis. Then, place a small piece of adhesive or a mark at a point equidistant from these three landmarks. This point will be directly over the neck of the femur. Fig. 23. Direct the rays through the neck directly underneath this point and place your cassette above the hip at right angles to the central ray. This usually gives a good lateral view of the hip. Fig. 24.



Fig. 8. How one can get a good anteroposterior view of the elbow when one is unable to extend the arm. A support is placed under the upper end of the humerus and under the wrist. The film is placed under the elbow joint and the rays are directed so that they bisect the angle of the arm and forearm to the film.



Fig. 10. This shows how one can get a good anteroposterior view of the distal end of the humerus in a supracondylar fracture which has been put up in acute flexion. The rays are directed through the upper end of the radius and ulna toward the supracondylar fracture line, angling slightly toward the shaft of the humerus. See Figures 12 and 13, which show anteroposterior views made in this manner.

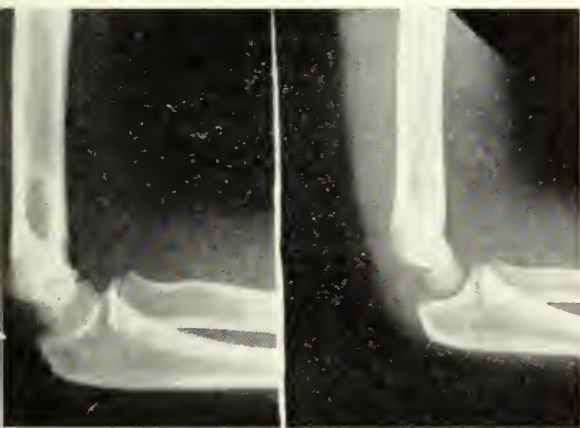


Fig. 9. Two lateral views of normal elbows of children ten and five years of age. Note that the capitellum forms an angle of 135 to 145 degrees with the shaft of the humerus.



Fig. 11. Supracondylar fracture of the humerus with marked lateral and posterior displacement of the distal fragments. See Figures 12 and 13.



Fig. 12. Views made of the fracture shown in Fig. 10 after the first attempt at reduction. The posterior displacement has been corrected, but in the anteroposterior view one sees that the distal fragment is still displaced laterally. This lateral displacement must be corrected, if one wants to obtain a good result. See Fig. 13.



Fig. 13. This is another view of the case shown in Figures 11 and 12 after the second attempt at reduction. Note that the lateral displacement of the distal fragment shown in anteroposterior view in Fig. 12 has been corrected and that the position and alignment are now excellent.

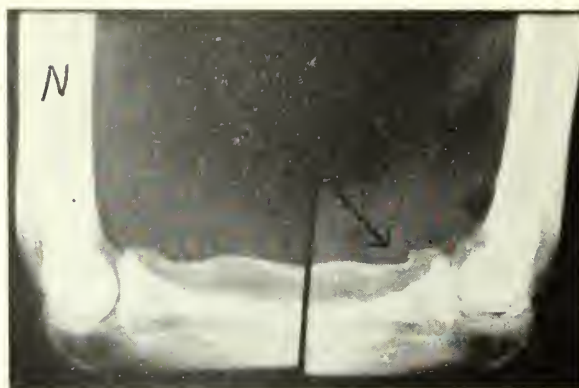


Fig. 14. Fracture of the neck of the radius. View marked "N" is of the normal side for comparison. On the normal view note the smooth curve of the neck of the radius. On the other view note the abrupt break in this curve at the point indicated by the arrow. The abrupt break in this smooth curve indicates the presence of a transverse fracture of the neck of the radius.

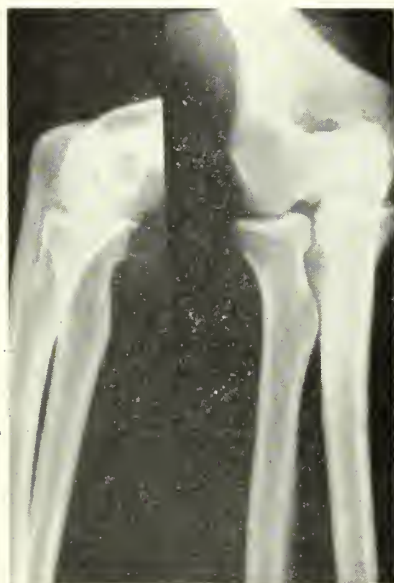


Fig. 15. Transverse fracture of the neck of the radius. On the lateral view note the abrupt break in the smooth curve of the neck. A careful study will show the fracture line extending across the neck just below the head.

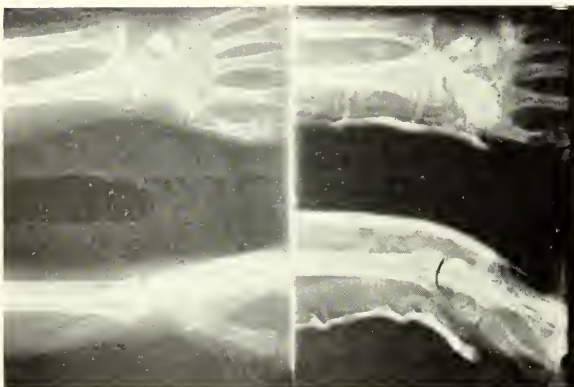


Fig. 19. Fracture of the distal end of the radius before and after reduction. Note that on the first films on the left made before reduction, on casual examination, the position and alignment appear to be good. The projection of a line perpendicular to the articular surface of the distal end of the radius shows, however, that the distal fragment is angled posteriorly. This posterior angulation must be corrected. Films made after reduction show that the normal angle has been restored.

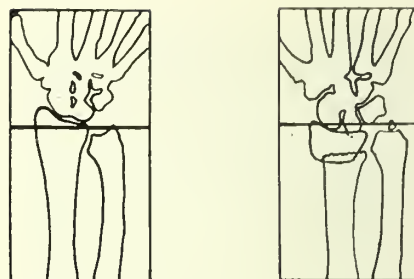


Fig. 16. The tracing on the left is from the roentgenogram of the anteroposterior view of a normal wrist. Note that the articular surface of the radius projects well beyond that of the ulna. The tracing on the right is from the same projection of a Colles fracture. Note that due to the compression and posterior angulation of the distal fragment the articular surface does not project well anterior to that of the ulna. For best results this normal relationship must be restored in reduction. (Skinner, E. H., J. A. M. A. 92:694).

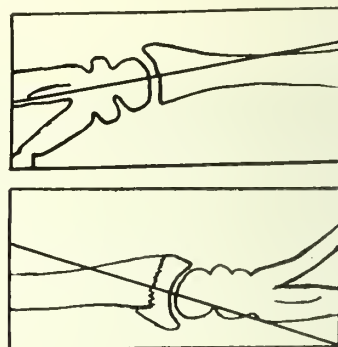


Fig. 17. Lateral tracing of a normal wrist and of a case with a fracture of the distal end of the radius. Note that in the normal a line projected perpendicular to the articular surface of the distal end of the radius will pass out through the posterior surface of the radius two to four inches above the wrist joint. In fractures of the distal end of the radius the distal fragment is usually angled and displaced posteriorly so that a line projected perpendicular to the articular surface will pass out through the anterior surface of the radius. It is very important to restore this normal angle in reduction.

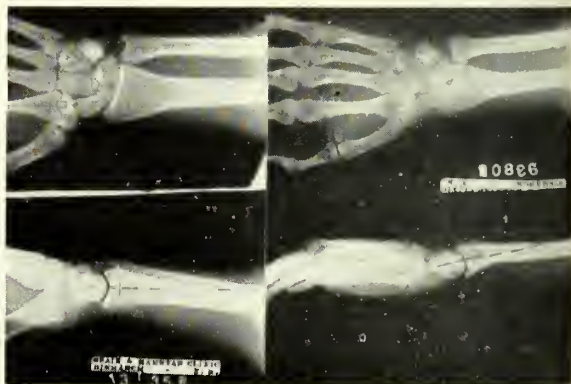


Fig. 18. Two views of normal wrists. On the lateral view the articular surface of the distal end of the radius is traced out and a line is projected perpendicular to it. Note that this line passes out of the posterior surface of the radius two to four inches above the wrist joint. Note also that the distal end of the radius projects well beyond the distal end of the ulna.



Fig. 20. Fracture of the distal end of the radius and styloid process of the ulna which had been treated elsewhere some months previously. Patient came in complaining of a painful wrist and a poor functional result. Note that the distal end of the radius does not project beyond the distal end of the ulna and that the articular surface of the distal end of the radius is angled posteriorly instead of anteriorly.



Fig. 21. This case had been treated elsewhere some months previously. Patient had a very poor functional result and complained of marked pain in the wrist. Note that the normal anterior angulation of the articular surface of the distal end of the radius is not present, but that the articular surface is angled posteriorly. The distal end of the radius also does not project beyond the distal end of the ulna. This patient would most likely have obtained a good result if, in reduction, the normal relationship had been restored and the wrist had been put up in such a position that this reduction would have been maintained during convalescence.



Fig. 22. Position in which the wrist has to be placed after a fracture of the distal end of the radius has been reduced. The wrist must be put up in marked flexion and ulnar deviation, if the fragments are to be held in correct position.



Fig. 23. Photograph showing the correct placing of the film and the tube for lateral views of the hip. The marker shown on the skin is at a point equidistant from the anterior superior spine of the ilium, greater trochanter and symphysis pubis. The neck of the femur will be located directly below this marker. The rays should be directed through the neck directly below this marker. The film should be placed at about right angles to the central ray. The tube is shown underneath the knee of the unaffected side.



Fig. 24. Intertrochanteric fracture of the neck of the femur. The patient has on a Thomas splint. The position and alignment are shown to be good on both anteroposterior and lateral views.

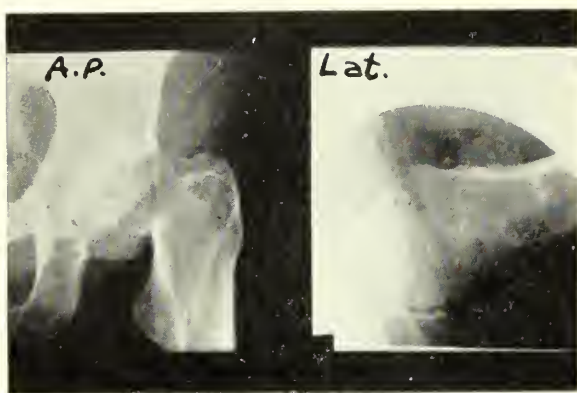


Fig. 25. Fracture of the neck of the femur close to the head. On the anteroposterior view the position and alignment appear to be fair. There is some upward displacement of the shaft. The lateral view shows that the position and alignment are poor and that the position will have to be improved. The head is rotated so that the fractured surface projects anteriorly. The neck and shaft are displaced anteriorly.

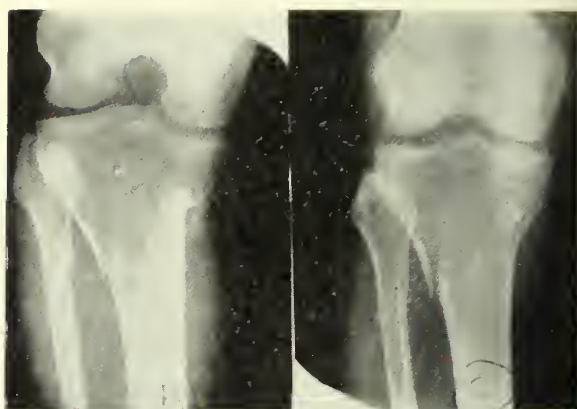


Fig. 27. Depressed fracture of the medial tuberosity of the tibia before and after reduction. This fracture was reduced by Dr. R. H. Waldschmidt using Quain's wall traction method. Note that in the view made after reduction the tuberosity has been pulled back to its normal position. Patient obtained an excellent result. (Quain, E. P. *Northwest Medicine* 31:188, 1932).

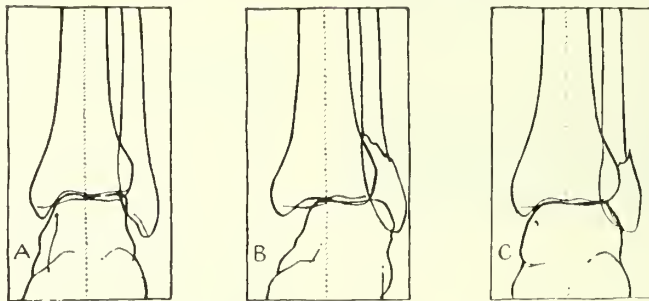


Fig. 29. "A, plotting of the normal weight-bearing central axis line of the tibia as it normally bisects the shadow of the head of the astragalus; B, failure of weight-bearing line of the tibia to bisect the head of the astragalus when the astragalus is dislocated outward externally with the fragment of the external malleolus; even though the fragments may be in apposition, if the astragalus is not reduced the result may be functionally embarrassed; C, correct reduction of astragalus and restoration of normal weight-bearing line." (Skinner, E. H., *J. A. M. A.* 92:694)



Fig. 26. Note the transverse fracture of the lower third of the shaft of the tibia and fibula. Note the second fracture of the fibula in the upper third of the shaft. It is very common to have two and even three fractures of the fibula with an associated fracture of the tibia. Therefore, in fractures of the tibia and fibula one should take views of both bones in their entirety.

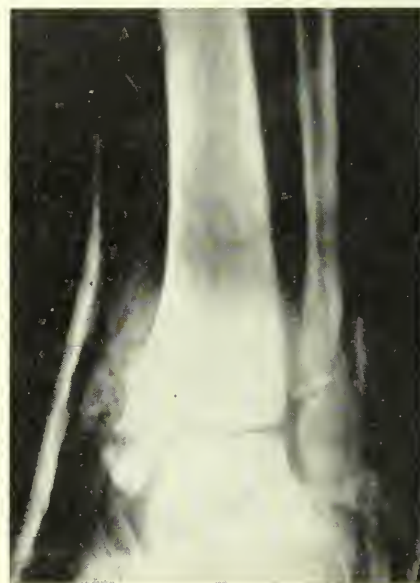


Fig. 28. Note the widening of the space between the distal end of the tibia and fibula. This widening indicates a tearing of the inferior tibio-fibular ligaments.

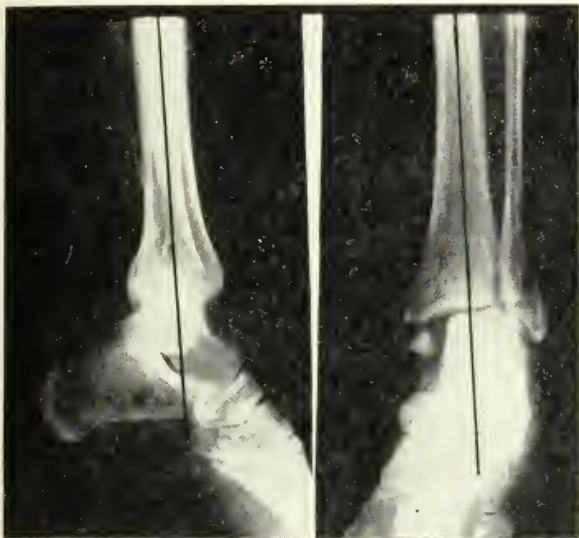


Fig. 30. Fracture of the internal malleolus, external malleolus and posterior aspect of the distal end of the tibia with lateral and posterior displacement of the astragalus. Note that a line drawn through the center of the tibia on the anteroposterior view helps bring out this displacement.

On the ordinary anteroposterior view, the position of the fracture of the neck may appear excellent; whereas the lateral view will show that the position and alignment are poor. Fig. 25.

Fractures of the shaft of the tibia and fibula.

In fractures of the shaft of the tibia and fibula, one must make anteroposterior and lateral films of both bones in their entirety. It is extremely rare to have a fracture of the shaft of one without a fracture of the other. Frequently, one sees a fracture of the lower end of the tibia and upper end of the fibula and *vice-versa*.

Occasionally, one sees a fracture of the lower part of the tibia with a second, and sometimes a third, fracture of the fibula higher up. Fig. 26.

Depressed fractures of the tuberosities of the tibia are seen occasionally following automobile accidents. Treatment in this type of fracture is difficult. One of our surgeons has been very successful in reducing this type of fracture by using Quain's* wall traction method. Fig. 27.

Fractures of the ankle joint.

1. It is very important to make anteroposterior and lateral views. Occasionally, an oblique view is of great value. It is very common to see a fracture of the internal malleolus, external malleolus, posterior aspect of the tibia or lower end of the fibula which shows up on only one of the two views and then is apparent only after careful study. Occasionally, the fracture lines will be visible only on an oblique view.

2. It is common in fractures of the internal and external malleoli to have an associated fracture of the posterior aspect of the distal end of the tibia. This is easily missed unless one is watching for it.

3. Frequently, one will have an injury of the inferior tibio-fibular ligaments. This is apparent by a separation or widening of the space between the distal ends of the

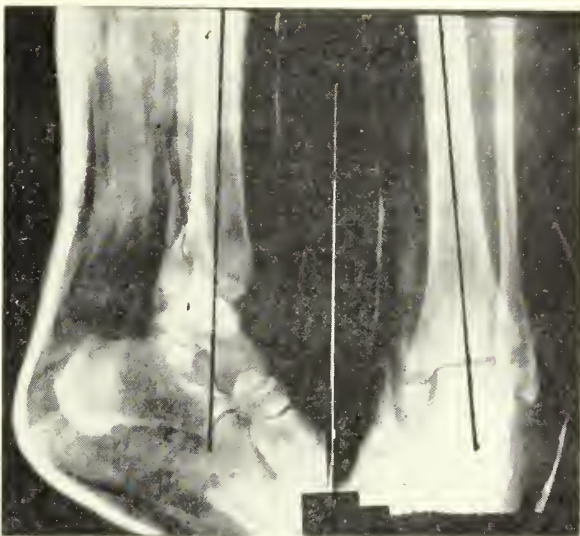


Fig. 31. Views of the same case as in Fig. 30 after the first attempt at reduction. Note that on the anteroposterior view a line through the center of the tibia goes through the center of the astragalus. On the lateral view, however, the astragalus is shown to be too far posteriorly, showing that the posterior dislocation has not been fully corrected. In order to obtain the best possible result in this type of fracture, the weight-bearing line through the center of the tibia must pass through the center of the astragalus in both views.

tibia and fibula. If present, treatment must be administered accordingly. Fig. 28.

4. In reducing fractures of the ankle joint, one must see that the weight-bearing line is restored, so that the line drawn through the middle of the tibia comes down through the center of the astragalus on both the anteroposterior and lateral views. Figures 29, 30, 31.

5. Frequently, one has a posterior displacement of the foot on the ankle joint in this fracture. If present, of course, this must be corrected. Figures 30, 31.

6. Non-union occurs quite frequently in fractures of the internal malleolus. It is well to be on the lookout for it.

Summary

The aim of this presentation was to bring to the attention of the man in general practice the following points on the technic and interpretation of roentgenograms of the extremities:

1. Obtain technically good films.
2. Always take two standard views at right angles to each other.
3. Be familiar with the normal roentgenological anatomy of that part.
4. Interpret the position and alignment from the standpoint of the normal roentgenological anatomy.
5. In reduction, see that the parts are replaced in their normal position and alignment.
6. Make re-rays after reduction and during convalescence, so that you are certain that the fractured parts are being maintained in good position and alignment.

A few special points on technic or interpretation have been presented on each type of fracture discussed.

* Quain, E. P. Non-operative Skeletal Traction for the Reduction of Certain Fractures, Northwest Medicine 31:188, 1932.

The Attitude of the Internist Concerning the Damaged Heart in Pregnancy*

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A GLOOMY MONOGRAPH by Angus Macdonald (Edinburgh) in 1878 entitled "The Bearings of Chronic Disease of the Heart upon Pregnancy, Parturition and Childbed" reported in detail the histories of thirty-one pregnant women with far-advanced cardiac disease, nineteen of whom died (61 per cent mortality). For forty years there was little change in the picture. From 1873 to 1915 almost all the cases of pregnancy with heart disease, collected from the Boston Lying-In records and published case reports, entered the hospital in decompensation and 46 per cent of them died.¹

A great wave of interest arose early in the twentieth century in the diagnosis of heart abnormalities, with the development of newer methods of examination. The functional concept came to equal, if not to surpass, the structural. With a better knowledge of the damaged heart came an understanding of medicinal agents, specifically, digitalis (1907 standardization; 1915 effective dosage), and of the value of rest and limitation of activities. Accordingly, a more vigorous and hopeful attitude spread rapidly through the medical schools and more slowly trickled out to the general profession.

But the attitude towards the damaged heart of the pregnant woman was still that of the obstetrician. He never knew that heart disease existed until decompensation appeared, and the internist knew nothing of pregnancy and labor unless the case became desperate. About 50 per cent of the pregnant patients with heart disease reported by Stander and Kuder² even in 1937 had no prior knowledge of their disability.

In spite of the increased optimism felt by the practitioner toward the management of heart disease and its emergencies, when pregnancy occurred the fears of inevitable and uncharted dangers seemed to paralyze him.

Macdonald said in 1878, "The principles of management in chronic heart disease with pregnancy are those of heart disease apart from pregnancy."

But the practitioner forgot that the principles of management had changed. He was likely to remember advanced and hopeless cases when he saw a young woman with a heart murmur, and to advise against pregnancy. Seldom could a practitioner acquire a sane judgment on the probable course of heart disease in pregnancy from the few and usually exceptional cases that he could remember.

MacKenzie³ in 1921 published his wise and temperate monograph, combining the observations of the family doctor and obstetrician with the analyses of the cardiologist, which was widely read and heeded, and led to a more critical, vigorous and hopeful attitude.

* Read at the meeting of the Minnesota Society of Internal Medicine, St. Paul, Minnesota, November 8, 1937.

In 1930, Reid could say, "It is my personal opinion that there is too little faith in the heart's ability to carry on, and too much radicalism in the treatment of the cardiac patients who are pregnant,"⁴ and Jensen's survey of statistics led him to conclude that "most women with heart disease bear children without added discomfort and require no care beyond regular supervision during the period of pregnancy."⁵

Prenatal Clinics

In 1921, Hamilton and Carr,¹ cardiologist and obstetrician, respectively, started the first prenatal clinic at the Boston Lying-In Hospital. Cardiological examination singled out cardiac patients for observation and management throughout pregnancy and labor, and resulted in a prompt and startling reduction in mortality from heart disease. The mortality rate fell from 21.2 per cent in 1922 to 2.7 per cent in five years by the following stages:

MORTALITY	
1873 to 1915	46 %
1922	21.2 %
1923	16.2 %
1924	8.6 %
1925	2.8 %
1926	5.1 %
1927	2.7 %

In 1922, Pardec⁶ (New York Hospital and New York Lying-In Hospital) advocated the use of functional tests, considering "the pathological condition of the heart much less important than the physiological reactions." The classification of the American Heart Association, or some modification of it, is almost universal now in the later reports from the prenatal cardiac clinics.

Out of these reports has come a mass of knowledge, some slight diversity of opinions, a clearing-away of misconceptions, a combination of cardiac and obstetrical treatment, and a growing attitude of conservative optimism toward the problem of pregnancy with heart disease.

Julius Jensen⁷ has collected records of more than 500,000 obstetrical admissions in this country and abroad. The recorded incidence of heart disease is 0.9 per cent. Of the 2,200,000 mothers in this country (1930), 20,000 have damaged hearts and 5 per cent or 1,000 die, as compared with 14,000 total puerperal deaths.

TABLE 1. (Approximate)		
2,000,000	(100%)	Pregnant women.
200,000	(10%)	Special heart examinations.
20,000	(1%)	Damaged hearts.
1,000	(.05 of 1%)	Cardiac deaths.
	(5% Mortality.)	

From the reports of various prenatal clinics it appears that about 10 per cent of all patients admitted require special cardiological study because of symptoms or signs

of circulatory abnormality, but only about 1 per cent (0.9 per cent) will be found to have cardiac damage. Of these 90 per cent to 95 per cent are rheumatic, with mitral stenosis predominant, alone or combined. Congenital, toxic, hypertensive and bacterial lesions constitute the balance almost entirely.

Diagnosis

Patients commonly complain of dyspnea, palpitation, edema and pulse irregularity in the course of normal pregnancy. They may be harmless even in the presence of heart damage, or may be the early warning of impending danger. Heart murmurs, displacement of the apex toward the left, X-ray and electrocardiographic signs of left heart enlargement and premature beats may all occur in the later months of pregnancy with a normal heart and must be evaluated by the physician. A false fear of heart failure is almost as grave as the neglect of cardiac danger.

Circulatory Changes in Pregnancy

As pregnancy advances, the work of the heart increases because of increased blood and plasma volume, intra-abdominal pressure, body weight and metabolic demands. The changes are gradual, but enough to embarrass even the healthy heart with its normal reserve. The damaged heart may easily decompensate under the added load unless protected by careful management. The slow increase of the load permits adaptation throughout. The first stage of labor does not involve the voluntary muscles and so puts no strain on the heart, but the second stage is attended with a rapid and marked increase of muscular effort.

The Dangers

Congestive failure occurred in from 16 to 33 per cent of the cardiac patients from four clinics (Lamb⁸, Daley⁹, Stander¹⁰, Carr and Hamilton¹¹), and in two-thirds of Jensen's⁷ fatal cases.

While the incidence of failure is highest during pregnancy, the incidence of death is maximum during labor, or a day or two later. Fatal decompensation most frequently appears during labor, but death may be deferred for a few days. Pulmonary edema, shock, pneumonia, embolism or pulmonary infarction may follow close upon the heart failure, and death from sepsis may be deferred for a week or two. Reis and Frankenthal¹² found that 1.8 per cent died in labor and 2.8 per cent later.

The ultimate prognosis of the 95 per cent who survive the puerperium seems to depend upon the natural course of the heart disease itself. Reid¹³ finds that statistics "support my clinical impression that women with rheumatic heart disease die before their time not because of marriage and pregnancy, but on account of the natural evolution of this disease." Daly⁹ found that 96 per cent of the hearts that failed recovered completely afterwards; less than 1 per cent died; and less than 3.5 per cent made an incomplete recovery. Lamb⁸ found that 56 per cent were no worse after the pregnancy. Corwin and Herrick¹⁴ reported 66 per cent free from cardiac symptoms on a seven-year follow-up; and Watson¹⁵

noted a 20 per cent mortality in ten years. Reid¹³ on autopsy material of 402 cases of death from rheumatic heart disease found the average age of death to be 43.2 in both sexes; of males 38.6 years; married females 42.4; and single females 44.8. Jensen and others have found no proof that pregnancy increases the death rate in rheumatic disease but only accelerates the end of those due to die in the near future in the natural course of the pathologic process.

Management

Examination of all pregnant women for cardiac abnormality leads to early diagnosis. Regular and frequent observation detects the earliest sign of failure. Decrease of activities and rest hours at home with sedation, if needed, may prevent the development of further embarrassment. If signs of congestive failure appear, hospital care with digitalization is indicated. The patient may have to spend the last part of the pregnancy or one or more short periods in the hospital. (Stander's patients of Class 2-b and 3 averaged six hospital admissions.) All effort should be directed towards maintaining cardiac compensation up to spontaneous labor. Macdonald in 1878 said, "Premature labor should seldom or never be necessary. It is likely to do more harm than good." Induction or other operative procedure is highly dangerous in the presence of decompensation. If compensation can be restored, the heart will probably be able to carry on to the end of pregnancy. If compensation cannot be restored, operative delivery, even early, is only an added load to a failing heart. There is only one reason for interruption of pregnancy—the failure to improve compensation by adequate medical means—and that is a doubtful reason, because the outcome is practically hopeless either way.

Assuming that a degree of compensation has been maintained up to the time of spontaneous labor, no fear need be felt in the first stage. During the second stage when the muscular effort is excessive, the patient must be watched for signs of cardiac embarrassment. It seems to be the common practice in the obstetrical clinics to apply low forceps to hasten the delivery and spare muscular effort if untoward circulatory symptoms appear. Stander considers a pulse rate of 110 and respiration of 28 in the second stage as an indication for forceps.

Cesarian section seems to be a short-cut and a solution of all obstetric complications to the radical obstetrician who employs it on slight provocation. The conservative considers this procedure unnecessary and dangerous except in a few of the obstetrical dilemmas, and never justifiable for the purpose of sterilization. It is of interest to note the diversity of statistics on this subject in contrast to the surprising agreement on others. The incidence of cesarian section because of heart disease from nine sources is tabulated below.

TABLE 2.

Year	M.D. & Hospital	%
1924	Daly—Chicago Lying-In	6.0
1927	Lennie—Glasgow Royal Mat.	19.7
1933	Watson—Sloane Mat.	9.15
1933	Carr & Hamilton—Boston Lying-In	14.0
1934	Stander—New York Hosp.	7.4
1935	Nelson & Eades—Boston Lying-In	32.0
1935	Reis & Frankenthal—Michael Reese	10.0
1935	Fitzgerald—Cook County Hospital	0.0
1936	Donovan—University of Sidney	32.6

It is of interest to note that Fitzgerald¹⁶ followed 126 women with 192 pregnancies out of a prenatal list of 19,000 without a single death, although he did no cesarian sections. A year after this report his mortality rate and cesarian section incidence were still both zero.

The third stage of labor (the placental) and the early puerperium carry a high incidence of death, due to the efforts of the expulsive stage, shock and pulmonary complications. Some obstetricians advocate the use of a sand bag on the abdomen or a tight abdominal binder in actual or potential circulatory failure, but this does not seem to be a universal practice.

Summary

Since combined cardiologic and obstetrical care of cardiac patients with pregnancy has become widespread, a large mass of knowledge has become available to the practitioner.

1. From 90 to 95 per cent of the cases have rheumatic heart damage and will follow the course with which the internist is familiar. Pregnancy has not been proved to hasten the average age at which death occurs.

2. Ninety-five per cent will survive pregnancy.

3. Radical obstetrical procedures are seldom necessary, if ever, for cardiac reasons and only add to the heart load which the internist tries to lighten.

4. Cardiac failure in pregnancy is amenable to the modern methods of diagnosis and treatment, just as is cardiac failure without pregnancy.

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Anterior Pituitary-Gonad Relationship in the Female, With Clinical Application*

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THE anterior pituitary is supposed to secrete two gonadotropic hormones, namely, the follicle stimulating hormone and the luteinizing hormone. It is still a disputed question whether these are two distinct hormones or whether these two effects on the follicle are the result of the action of a single hormone under different conditions occurring during the normal menstrual cycle.

Ovarian Hormones

- a. *Dihydrotheelin*. Doisy and co-workers on March 22, 1935, reported the isolation of an ovarian follicular hormone in crystalline form from the follicular fluid of pigs' ovaries. This is the only estrogenic hormone that has been proved to be secreted by the follicle of the ovary. It seems to be identical with a reduction product which was made synthetically and which was also known as dihydrotheelin.

- b. *Progesterone*. Progesterone is the official name for the luteinizing hormone secreted by the corpus luteum of the ovary. The name progesterone is a combination of two names for the same hormone, namely, progestin, isolated by Corner and Allen of the University of Rochester, and luteosterone, isolated by Butenandt and Slotta of Germany. Therefore, the word progesterone is a contraction of the two terms used for the same substance. Progestin has been produced synthetically from pregnandiol, which is found in the urine of pregnant women, and also from stigmasterol, a wax obtained from soy beans. It has recently been found that if progesterone is injected into the body, it can be almost completely recovered in the urine as pregnandiol, indicating that pregnandiol is an oxidation product of its precursor, progesterone.

Placental or Urine Hormones

The placental hormones are supposed to be secreted by the placenta and are chiefly recovered from pregnancy urine, but may be recovered to some extent from am-

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niotic fluid. The first and most important of these placental hormones is theelin.

a. *Theelin*. Zondek and Aschheim in 1927 found that the urine of pregnant women contains large quantities of estrogenic hormones. Doisy, using such urine, was the first to isolate an estrogenic hormone in crystalline form and this he named theelin.

b. *Theelol*. Theelol is another estrogenic substance which was isolated at about the same time by Doisy of St. Louis and Marrian of England.

c. *Emmenin*. A third estrogenic hormone known as emmenin which is very similar to theelol was isolated by Collip. Theelol differs from emmenin in that theelol is ether soluble and emmenin is ether insoluble, suggesting some change in the structural formula differing from that of theelol.

d. *Anterior Pituitary-like Hormone*. Aschheim and Zondek in 1927 found a substance in pregnancy urine which they named prolan, and which was at first thought to be the anterior pituitary gonad stimulating hormone, but this has been disproved. A.P.L. is definitely not the gonadotropic hormone of the anterior pituitary. A.P.L. or prolan is the substance that exists in the urine in pregnancy that is responsible for the production of the Aschheim-Zondek and Friedman tests for pregnancy.

So that there will be no confusion, I will briefly review the hormones that have to do with sex in the female. The anterior pituitary produces the follicle stimulating hormone and the luteinizing hormone. The ovary secretes the estrogenic hormone dihydrotheelin (theelin) and progesterone, the luteinizing hormone. The placenta supposedly secretes theelin, theelol, emmenin and A.P.L.

Theelin Experiments:

Physiology of Theelin in the Human Castrate

The human female, female apes and old world monkeys are the only animals that menstruate in the ordinary sense of the term.

Edgar Allen was able to produce menstruation in eight ovariectomized monkeys by the injection of follicular and placental extracts. Menstruation began within a few days after cessation of the hormonal injections. In these experiments, full premenstrual development of the endometrium was not obtained. He says: "Theelin, alone of the ovarian hormones, seems sufficient to supply the essential mechanism of menstruation. Theelin produces the growth phase in the accessory genital organs. This includes accelerated growth of the vaginal epithelium, growth of the glands of the cervix and body of the uterus to the interval condition, probably some repair of ciliation of the tubes, and, toward the end of this interval, the initiation of growth in the mammary gland tree including the nipple."

Werner and Collier, St. Louis University, duplicated on the human female castrate the work of Edgar Allen on the monkey. They also were able to check on the

symptoms complained of by castrates which could not be determined on the monkey. The following are the conclusions on the first experiment:

1. Theelin restores the breasts and genital tract of women to apparently the normal sexual state after previous castration atrophy.

2. Theelin produces changes in the atrophied endometrium of castrated women that approximate or equal the interval changes found in the normal women at the time of ovulation.

3. Theelin does not produce the pregravid changes in the endometrium of castrated women.

4. The bleeding from the uterus of castrated women induced by Theelin occurs from an endometrium approximating or equaling in development the interval changes found in the uterus of normal women.

5. Theelin induces bleeding from the uterus of castrated women qualitatively indistinguishable from menstruation in normal women.

6. This bleeding from the uterus of castrated women is accompanied by the subjective symptomatology usually experienced by normal women during menstruation.

7. Theelin relieves the subjective symptoms that occur in women following castration.

8. Four ovariectomized women to whom large doses of theelin were given state that "libido was markedly increased."

9. Excessive doses of theelin were given to women intramuscularly over a period of from eighty-nine to ninety-three days without seeming discomfort, until a dosage of from 6 to 8 cc. daily was reached.

In a second experiment, in which eight castrate girls were used, Werner and Collier duplicated the results obtained in the original experiment besides finding that 2800 rat units would initiate endometrial growth when the element of time is taken into consideration.

In a third experiment, in which sixteen castrate girls were administered theelin in oil in varying dosages, the following conclusions were determined:

1. Theelin in oil stimulates development of the sex-related structures of the human female, producing changes in the breasts, gross appearance of the vagina, with increased mucous secretion, and growth of the endometrium and vaginal mucosa in dosages as low as 5,000 international units.

2. Definite changes in the vaginal smears were noted with dosages of theelin in oil as low as 10,000 international units. Vaginal smears would appear to be a less delicate index of theelin administration than uterine mucosal specimens. Relief of symptoms of castration was obtained with dosages as low as

5,000 international units, which is insufficient to produce the full follicular phase in the vaginal smears.

3. This experiment proves that dosages of 5,000 international units of theelin in oil, when the element of time is considered, will mitigate or relieve the symptoms of castration; but, at the same time, will stimulate development of the endometrium sufficiently to cause uterine bleeding when discontinued.

4. Theelin in oil is much more effective than theelin in aqueous solution. When administered intramuscularly in the human being, smaller dosages and less frequent intervals of injection produce more rapid and more marked effect on the endometrium and vaginal mucosa.

5. The evidence seems conclusive that the large dosages of theelin advocated by some (from 30,000 to 50,000 rat units) as necessary to produce the interval phase of the endometrium are grossly excessive.

Syndrome Accompanying Deficiency or Absence of the Ovarian Follicular Hormone in 197 Cases (53 Castrates, 96 Menopause, 48 Involutional Melancholia)

<i>Order of Frequency of Symptoms</i>	<i>Per Cent</i>
1. Menstrual Disturbances	99.2
2. Nervousness, subjective	97.6
3. Hot flushes	89.0
4. Excitability	85.7
5. Fatigability and lassitude	83.7
6. Depression and crying	77.4
7. Constipation	76.2
8. Irritability	75.1
9. Tachycardia, palpitation and dyspnea	68.8
10. Vertigo	67.4
11. Decreased memory and concentration	66.8
12. Sleep disturbed	66.1
13. Amenorrhea	57.6
14. Headaches	56.4
15. Psychosis	52.2
16. Occipitocervical aching	50.6

17. Scotomata	49.4
18. Numbness and tingling	48.3
19. Cold hands and feet	35.3
20. Formification	25.4
21. Vague pains (recorded for involutional melancholia)	77.1

It is the belief of Werner and his associates that they have secured sufficient evidence by controlled clinical research to justify their belief that involutional melancholia is only the exaggerated stage of the menopausal syndrome. In an article published in the *Journal* of the American Medical Association, July 7, 1934, and in a second article in the *Archives for Neurology and Psychiatry*, May, 1936, they give proof of the etiology and treatment of involutional melancholia.

Treatment

The treatment for relief of the syndrome, characteristic of castration, ovarian hypofunction, menopause and involutional melancholia is estrogenic hormones. Any of the standard preparations of estrogenic hormones which have been accepted by the Council of the American Medical Association may be used to relieve these symptoms.

One thousand or two thousand international units of estrogenic hormone may be injected three times a week into the upper third of the gluteal muscle, alternating sides each time. A small strip of adhesive, 1x1 inch should be placed over the injection site immediately, for oil solutions may leak if this is not done. In severe cases, such as involutional melancholia, it may be necessary to inject two thousand international units estrogenic hormone daily during the first month. After this, injections may be given every other day. With improvement in many of these conditions after the first month or two, treatment should be continued for from three to six months.

The only criterion as to whether the patient has attained the glandular adjustment characteristic for the postmenopausal period is to discontinue treatment, and if the symptoms do not return, the patient is well. If the symptoms do return, then treatment must be re-instituted for from one to two or three months, again depending on the severity of the symptoms.

After the Diagnosis, What Next?*

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Initial Examination of Entering Students

TUBERCULIN TEST. The first step in a tuberculosis control program for any school consists of administering the tuberculin test to all of the entering students. The material to be used in the test may be either Old Tuberculin or Purified Protein Derivative. The latter has the advantage of being so standardized that its potency is the same at all times and wherever used. It has the disadvantage of being considerably more expensive than Old Tuberculin. The disadvantage in Old Tuberculin is that it is not always prepared with the same potency, although undiluted Old Tuberculin retains its original potency for years. The small cost is its chief advantage. While it would be desirable for all of our institutions to use Purified Protein Derivative, so as to have the results in one institution slightly more comparable with those in other institutions, Old Tuberculin is not in the discard and the results of an institution which continues to use it are still valuable. The program of tuberculosis control among cattle of this country was carried on with Old Tuberculin and the results obtained testify to its value. The number of positive reactors detected through Old Tuberculin properly used is essentially the same as through Purified Protein Derivative.

The controversy over methods of administering tuberculin has about subsided in favor of the intracutaneous method. While this is generally recognized as slightly more accurate than other methods because of the measure of dosage, the epidermal and the percutaneous test, when done in a painstaking manner, are of definite value.

A variety of opinions is held about the amount of tuberculin to be administered. In the case of Old Tuberculin, some use 0.01 milligram or less as the initial dose, others 0.1 milligram, and if no reaction appears 1.0 milligram is administered as the second dose. Still others use a full milligram as the first and only dose. For the initial dose 0.1 cubic centimeter of a solution of one part of tuberculin in 999 parts of normal salt solution (0.1 milligram of tuberculin) is entirely safe. While

the person whose tissues are extremely sensitive to tuberculo-protein may present a four plus reaction, this is not harmful, and the number with such reactions is small. Those who do not show a typical reaction with this dose should have a tenth of a cubic centimeter of a solution of one part of tuberculin in ninety-nine parts of normal salt solution administered approximately one week later. If the typical reaction is not seen in forty-eight to seventy-two hours, the student may be considered free from the primary tuberculosis complex, although the occasional delayed reaction appears later than seventy-two hours and the occasional person will react positively if the dosage is increased beyond one milligram. However, the total of these exceptions is of little significance in a tuberculosis control program in an educational institution. When Purified Protein Derivative is employed, the usual second doses should be administered for all who are negative to the first dose.

The time of reading the tuberculin test should be forty-eight hours after administration, although the characteristic tuberculin reaction often is in evidence much longer than forty-eight hours.

The reading of a tuberculin reaction is of great importance. All too often in the past, it has been done in a haphazard manner, and by persons who have not been adequately trained. There is still a strong tendency to over-read. Areas of pinkness or redness of the skin which disappear in less than forty-eight hours are usually of no significance. The recording of such areas as positive reactions may do great harm to the individual. In the first place, he is falsely led to believe that he has been infected with tubercle bacilli. His family physician may later administer the test and find it negative, whereupon the student and his close associates have their confidence in the health service shaken. In the second place, if a tuberculin test is recorded as positive on the records, even if there is insufficient evidence, at some subsequent time, the record may be used against him. For example: some insurance companies are beginning to give the tuberculin test consideration, and there are already instances of persons with positive reactions either having been denied insurance or having had it issued with an increased rating. In several of our states tuberculosis has become a compensable disease; that is, if it is found to exist while an individual is in the employ of certain industries, hospitals, etc., the tuberculous individual may be compensated. The decision of the industrial commission or the court may rest upon whether the tuberculin

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test was positive when that individual was employed. If it is learned that a test was administered when such a person was a student, health service records may be subpoenaed and, if a positive reaction is recorded, this person, who has since fallen ill from tuberculosis, may be denied compensation. These statements are based on actual occurrences, and the tuberculin test reports in the future will be important evidence in insurance and compensation cases.

Apparently, the degrees of sensitiveness of the tissues to tuberculo-protein is not a criterion of extent of tuberculosis; that is, a person with a mild but typical reaction may have as much or more disease as one with an intense reaction. Therefore, the administration of a second dose consisting of one milligram of tuberculin to all students who react negatively to the first dose is essential. This is important, first, because students who have primary complexes in their bodies should know of the existence of this condition in order that they may subsequently be on their guard; second, because in the case who later develops a lesion demonstrable by X-ray examination, one may be able to determine whether it is a first infection or reinfection type of disease by knowing definitely the previous reactions to the tuberculin test. Again, the student may actually have clinical disease with such a low degree of sensitization that it is not revealed by the initial test dose of tuberculin. Such students may remain in school with their disease undetected unless the second dose of tuberculin is administered. When the test is not completed and a student is later found to have clinical disease by reason of development of symptoms, *etc.*, considerable harm may have been done to other students on the campus and the individual's disease may have progressed to such a point as to reduce his chances of recovery. If the disease does not manifest itself until the junior or senior year has been reached, one is at a loss to determine whether it was present on admission or whether it developed while he was in school. Therefore, the tuberculin test should be completed and properly read for every student on admission to school.

A good example is that of a student who was admitted to a university in September, 1932. He was given 0.01 milligram of tuberculin, to which he reacted negatively. For some reason the test was not repeated. In November, 1935, he reported because of chest pain and was found to have chronic pulmonary tuberculosis in the moderately-advanced stage with evidence of cavitation. Tuberculosis may develop to this degree in less than three years, but it usually requires a much longer period. The unfortunate fact is that he was not given a sufficiently large dose of tuberculin on entrance examination to rule out tuberculosis.

A positive tuberculin reaction has certain definite characteristics: one is that it usually persists more than forty-eight hours; another that it presents an area of edema or induration at the site of administration and this is usually surrounded by a halo of pinkness or redness of the skin, although in the occasional case this halo is faint or entirely absent. Unless these characteristics are present, one should never interpret the re-

action as positive. If only an area of pinkness or redness of the skin appears, regardless of its size, the test should be repeated with a larger dose of tuberculin and, if the typical reaction does not appear, it should be recorded as negative and repeated three to six months later. The degree of positiveness is apparently of no significance, therefore, we no longer record anything more than a positive or negative reaction.

Among students entering college, an increasing number have previously had the tuberculin test administered as a part of the high school tuberculosis control program of their communities or by their private physicians. Those who present sufficient evidence that they had characteristic positive reactions need not be re-tested, but should be dealt with subsequently in the same manner as those who were found to react positively on admission.

A definitely positive tuberculin test is diagnostic of the presence of at least one primary tuberculosis complex somewhere in the body. Probably the development of a single complex following infection with tubercle bacilli is rare. If a careful search is made at post-mortem, multiple complexes are usually discovered. When a primary complex is found in a lung, it does not preclude the existence of similar complexes in other parts of the body, such as the brain, liver, and spleen. Therefore, with no other phase of an examination but a positive tuberculin reaction, we arrive at a diagnosis of at least primary or first infection type of tuberculosis.

There is no longer any justification for drawing a dividing line between tuberculous infection and tuberculous disease, since any infection that has caused a characteristic tuberculin reaction has resulted in tuberculous lesions. The tubercle bacillus, like the spirocheta pallida, incapacitates slightly or not at all when the primary lesions develop, but both micro-organisms are capable of living in the human body over long periods of time. Although in a majority of persons, they do not attack vital organs so as to cause significant symptoms of disease at any time during the individual's life span, it now appears that approximately one in three who develop primary syphilitic lesions, and one in four who develop primary tuberculous lesions, have incapacitating disease in one or more parts of the body at some subsequent time. The development of incapacitating disease cannot be determined in advance; it may be within a few months after the primary lesions are laid down, or it may be in senility, or at any intervening time. Therefore, we must look upon our diagnosis of the first infection type of tuberculosis, made solely through the characteristic reaction to tuberculin, as a serious matter for approximately one in four of our students. Inasmuch as we have no way of determining the one who will later fall ill, we must treat the four alike. By treatment we do not refer to cancellation from school, hospitalization, or any other active procedure unless lesions of clinical significance are found to co-exist. The student who reacts positively to the tuberculin test but has no clinical manifestations of disease probably has as much tuberculosis as the individual who reacts posi-

tively to the Wassermann test with no clinical manifestations has syphilis. The positive Wassermann reactors are immediately treated because we have preparations which we believe act as disinfectants when introduced into the blood stream. If we had similar preparations for disinfecting the body with reference to tubercle bacilli, we would strongly recommend that they be administered to every student who reacts positively to the tuberculin test. Therefore, we must inform every positive tuberculin reactor of the potentialities and inasmuch as no specific therapy is available we should train him in the procedures which should be practiced throughout the remainder of his life: First, to avoid every possible source of further contamination with tubercle bacilli; second, if he does not now have progressive disease to let no year pass, even though he lives to ninety, without an adequate examination for clinical tuberculosis.

X-ray Examination. X-ray film examination of the chest should be made at once of every student who reacts positively to tuberculin on admission to our institutions. Unfortunately, in many of our schools the X-ray examination of the chests of positive tuberculin reactors must be distributed over a period of months because of lack of the most modern equipment. The usual method of making X-ray films of the chest is too slow for health service work on entering classes. Students may enter in the fall and react positively to the tuberculin test but cannot get an X-ray appointment until the winter or spring quarter and then be found to have clinical tuberculosis. This results in loss of time from the standpoint of the individual's treatment and may create a hazard on the campus. Modern equipment provides for the making of approximately one thousand X-ray film exposures with one machine in a single day at an expense far below that which any ordinary X-ray laboratory can afford. The films made by this rapid method are entirely adequate. Thus, within a week's time one can complete all of the X-ray work on the positive reactors of the entering class of a large university. The practicability of this method is being demonstrated annually at the University of Pennsylvania.

The X-ray film is of little value in detecting the location of the primary complex, as only a small percentage is located in this manner. Even though films are made in various diameters of the chests of positive reactors, they do not demonstrate the location of a lesion in more than 25 per cent and usually in a much smaller number. Therefore, they fail in 75 per cent or more. Among the 4,372 students who entered the University of Minnesota in the fall of 1936, all but seven were tested with tuberculin. Of the remaining 4,365, positive reactions were recorded for 1,004, all of whom had X-ray film examinations made of the chest with the exception of twenty-two. Of the remaining 982, only 140 or 14.2 per cent, showed evidence of the primary complex by presence of calcium deposits, etc., in the parenchyma, hilum, or both. Arguments have been offered for the X-ray film examination of the chest of all entering students and the elimination of the tuberculin test. Where all phases of the tuberculosis problem are under consid-

eration, the X-ray film alone is inadequate, since any program which does not include the tuberculin test misses 75 per cent or more of the potential cases of clinical tuberculosis.

When the X-ray film is negative, we have failed to locate the primary complexes; they are present somewhere in the body and the examiner must guard against the student's receiving a false sense of security because the X-ray film is clear. Such students may be classified as having the first infection type of tuberculosis with the location of the lesion not determined by X-ray film.

The group of students, who react positively to tuberculin on admission and whose X-ray films show evidence of primary complexes, are classified as having the first infection type of tuberculosis with the location of at least one of the lesions determined by X-ray film examination. If calcium has been laid down in or around the lesion so as to be demonstrated by the X-ray film and there is no other evidence of the disease, we are justified in stating that the lesion probably is well under control. For such lesions the word "healed" should never be used during the life of the individual, since frequently there is pathological activity in and around them and virulent tubercle bacilli are present. From these lesions, as well as those which cannot be located by X-ray films, tubercle bacilli may escape, find lodgment on allergic tissues and set up the reinfection or destructive form of disease.

Some students may have been infected shortly before entering school and some will become infected while in school. On a few X-ray films of students with recent infection, evidence of the primary complex will be seen in the form of a homogeneous parenchymal shadow which may be small or large. When one can be certain through previous periodic tuberculin testing that the infection is recent and, therefore, the lesion is of the primary type, no immediate active treatment is necessary. However, the possibility of acute reinfection forms of disease caused by tubercle bacilli from the primary complex, such as pleurisy with effusion, tuberculous pneumonia, and miliary tuberculosis must not be overlooked.

In reality we make X-ray films of the chest primarily to detect shadows which may represent chronic reinfection type of pulmonary tuberculosis. At this point, emphasis must be placed upon the fact that *the etiology of a lesion which casts a shadow cannot possibly be determined accurately by the X-ray examination.* Many persons have been done injustice by having definite diagnoses made by X-ray shadows alone. A good example is that of a girl who was being admitted to a school of nursing. A shadow in the right lung was immediately reported as due to tuberculosis in the moderately-advanced stage. The supervisor of this school of nursing cancelled the girl's registration before a complete examination could be made. The girl was immediately sent to a sanatorium, where the tuberculin test was found to be negative and the shadow completely disappeared within two weeks. Shadows cast by pneumonia, malignancy, and a number of other conditions have frequently been diagnosed as tuberculous and *vice versa*.

Therefore, the X-ray film examination is purely a weeding-out of those who require most careful and complete examinations to determine etiology of lesions and necessary treatment. Among the positive tuberculin reactors, the X-ray film is our most valuable agent for this selective process but its limitations must be recognized. Reports from an X-ray laboratory are not adequate for the clinician as it is impossible for anyone to describe in words the photographic record on an X-ray film. The shadow must be seen by the clinician, himself. Therefore, all X-ray films on the chests of students should be stored in a place where they are readily available to the clinician on a few minutes' notice. Many diagnoses from the X-ray film alone will prove wrong as the years pass, and the attendant harm of any wrong diagnosis will follow.

Complete Examination. When a student is found to have a shadow on an X-ray film, cast by a lesion in the lung parenchyma, an attempt should be made to determine etiology through laboratory examinations, *etc.* Such persons may have no cough. They may produce no sputum or only a small amount by clearing their throats, but this should be carefully examined. The recent work of Stiehm has shown that students with such lesions may have tubercle bacilli revealed in the gastric contents. If the etiology cannot be determined by finding tubercle bacilli either in the sputum or gastric contents, it may be necessary to keep the student under observation and make serial X-ray films. A shadow that persists more than a month usually is not caused by pneumonia. When due to tuberculosis, the shadow may remain unchanged in extent or nature; on the other hand, it may slowly decrease in size; again, it may increase in extent or evidence of excavation may appear.

Treatment. All students, who are under observation because of the presence of X-ray shadows, should be instructed to reduce their outside activities to a minimum, and, if the shadow decreases in size, this may suffice. If on the other hand, the shadow increases in size or cavitation appears, one can be reasonably safe in diagnosing the lesion as tuberculous, even though tubercle bacilli have not been recovered. The following illustrates this point. In the spring of 1935, at the age of eighteen years, this student reacted positively to the tuberculin test in high school. X-ray film of the chest showed evidence of a small area of disease in the left upper lung field. She entered the University of Minnesota in the fall of 1935. X-ray film revealed evidence of a small area of disease in the left upper lung field. When compared with the film made the previous spring, no change was revealed. Subsequent films in 1936 showed no change. On October 12, 1937, there was evidence of definite increase in extent of disease, with a possible small cavity developing. Ambulatory artificial pneumothorax was instituted October 27, 1937.

On the entrance examination, unmistakable cases of moderate or far advanced pulmonary tuberculosis may be found among healthy appearing students. For them, treatment should be instituted at once, even though symptoms are absent. Here the health service staff may

encounter an extremely difficult problem in convincing the entering student that significant disease exists. This probably is due to the fact that the public considers tuberculosis synonymous with consumption; that is, no one is thought to have the disease unless such symptoms as marked loss of weight and cough are present. A good example is that of a student who had no symptoms, but on the admission examination was found to have definite evidence of advanced disease. He and his family refused to accept the diagnosis and five years later we saw him in a tuberculosis clinic after symptoms had appeared, his disease had increased in extent, and his sputum was teeming with tubercle bacilli. It was not until he had fallen ill that he or the family could be convinced of the presence of tuberculosis. Ordinarily, however, the health service staff, can convince the majority of such students of the presence of disease.

Those students who are found to have frank pulmonary tuberculosis and those whose lesions with undetermined etiology are proved to be due to tuberculosis of a progressive nature on admission, should have treatment instituted, in keeping with extent of disease, *etc.* The student who has bilateral disease or sizable cavities with positive sputum should not be permitted to continue in school, but should be given careful advice with reference to adequate treatment. Here the family physician's co-operation is essential. The student should be instructed to report to him at once and carry out every procedure recommended. If the physician does not treat tuberculosis, the health service staff may aid him in arranging the proper location for the patient. As long as adequate care is provided, the place of treatment is extraneous. Many will do well to enter a hospital or sanatorium and remain in the institution until the disease is under control. Throughout the course of treatment the health service staff should keep in contact with the patient and the family physician.

For those students who have progressive minimal or moderately advanced disease and have no sputum or that which does not contain tubercle bacilli, ambulatory artificial pneumothorax may be instituted, and they may be permitted to continue in school. When such treatment is begun, explanations should make it clear that if adequate collapse cannot be obtained or if significant complications develop, the registration must be cancelled and more drastic treatment instituted. At the University of Minnesota, many such students with ambulatory artificial pneumothorax are in school. Some have completed their courses without significant handicap and are now engaged in their professions. For some students we have insisted upon a period of strict bed rest while artificial pneumothorax was being instituted. The duration of this period depended upon the degree of collapse, general well-being of the patient, and presence or absence of complicating factors. Three months or less has usually sufficed. However, in some cases a much longer period was found necessary. In an occasional student for whom ambulatory artificial pneumothorax was recommended, an adequate collapse of the lung was found impossible because of adhesions. Such students have

always been referred to their family physicians for whatever treatment seemed indicated. Artificial pneumothorax is rarely discontinued, on advice, in less than three years, no matter how small the lesion when the treatment is instituted. For those who have cavitation of the lung, we do not feel that even three years is a sufficient period of time to insure permanent obliteration of cavities and satisfactory control of the disease.

Subsequent Periodic Examinations and Treatment

The student health service staff has a significant responsibility in tuberculosis control among all the students who are admitted. Having completed the weeding-out process of the positive reactors among the entering students and having excluded those who should be on strict bed rest, plus collapse therapy when indicated, and having placed on treatment, such as ambulatory artificial pneumothorax, those for whom it is indicated, a careful program must be outlined for the remainder who constitute the great majority.

Just as there can be no primary tuberculosis complex in the absence of tubercle bacilli, so there can be no reinfection type of clinical tuberculosis in the absence of the primary complex. Therefore, students whose tuberculin tests were positive on the entrance examination, regardless of whether the X-ray film revealed any evidence of the location of the primary complex, such as Ghon tubercles or calcium deposits in the hilum region, should be re-examined, at least, annually. Here the rapid method of making X-ray films is of definite advantage. This annual examination is made to bring to light at the earliest possible time any evidence of the reinfection type of disease that may appear in the lung. While such reinfection foci probably exist a long time before they cast shadows on the X-ray films which can be visualized, the film will reveal their presence a long time, usually years, before any serious symptoms are present or any abnormal physical signs can be elicited. Therefore, annual examination should consist of an X-ray film of the chest and, if any shadows appear which were not previously present, a complete examination should be made to determine the etiology. The following cases illustrate this.

A student of twenty-two years, in September, 1934, reacted positively to the tuberculin test. X-ray film in January, 1935, was reported to reveal no evidence of disease. In 1937, he was found to have unmistakable pulmonary tuberculosis involving the left lung. He was admitted to a sanatorium, where artificial pneumothorax was attempted. Adhesions prevented the complete closure of a large cavity. However, intrapleural pneumolysis was successfully performed, and the cavity is now well-collapsed. Although this former student has been on strict bed-rest in an institution since his disease was detected, definite lesions have made their appearance in the right lung.

Another student entered a university as freshman in a school of engineering at the age of twenty years on September 27, 1932. He reacted positively to the tuberculin test, and the X-ray film of the chest made on Jan-

uary 23, 1933, showed no evidence of disease. On May 17, 1937, he was admitted to the hospital. Previous to admission, he had a daily chill for five days. He complained of non-productive cough, heaviness in the chest, and pain between the shoulders. X-ray films of the chest made on May 18, May 25, June 1, and June 3, were negative. The film on June 25, 1937, showed rather unusual broadening of the superior mediastinum, which suggested possibility of a mediastinal abscess or tumor. However, the position of patient was thought to have caused this change. Although the film made on July 17, 1937, was reported as probably negative, death occurred on August 3, 1937. Postmortem examination revealed miliary tuberculosis, involving lungs, liver, spleen, kidneys, thymus, lymph nodes, and left seminal vesicle. Miliary tubercles in the lungs ranged from one to four millimeters in diameter and most of them were two to three millimeters and showed evidence of caseation. The hilum and peritracheal lymph nodes and a mediastinal mass were large and caseous.

Another student of twenty-two years reacted positively to the tuberculin test in 1930. The X-ray films appeared entirely clear. In 1935, she was found to have extensive disease with cavitation in the left lung. Adhesions prevented adequate collapse by artificial pneumothorax and extrapleural thoracoplasty was necessary to control her disease.

In October, 1932, an entering student reacted positively to the tuberculin test, but the X-ray film revealed only evidence of calcium deposits in the right lung and hilum region on January 29, 1935. He was apparently in good health. However, on December 30, 1935, he was found to have frank pulmonary tuberculosis involving the right lung. Artificial pneumothorax was successfully instituted, and his disease is now apparently well under control.

All students who on the entrance examination react negatively to tuberculin should have the test repeated annually and every three to six months in case of any known exposure. In the University of Minnesota the number of positive reactors among the students in the College of Education has been found to increase about one per cent each year. This apparently is the approximate infection attack rate in the general community.

In institutions that have schools of nursing and medicine, the tuberculosis problem among the students of these particular schools is increased many times, because of the exposure of students to tuberculous patients. If students are compelled to take tuberculosis services, the only solution of this problem is to treat tuberculosis as a contagious disease; in other words, to set up a barrier between the patient and the student which will prevent the transmission of tubercle bacilli. When this is done, the infection attack rate should not be appreciably greater among students in our schools of nursing and medicine than in the general population of the community in which they reside.

Students who on re-testing become positive tuberculin reactors should immediately be grouped with those who reacted positively on admission and treated in the same

manner; that is, have an X-ray film examination of the chest at once and annually thereafter. Contrary to a general opinion of a few years ago, and one which is still extant, the young adult who becomes infected for the first time rarely develops clinical tuberculosis immediately. In fact, among those whom we have observed, the course of the disease has been essentially the same as that which we have seen among children when first infected, that is, the first manifestation of the disease is a positive tuberculin reaction; usually no significant symptoms are present. For the vast majority, the X-ray film of the chest is clear and remains so; for a small percentage within three to four months, the primary parenchymal focus may be visualized on the X-ray film. However, it nearly always comes under control without treatment.

Following the development of the primary complex, clinical tuberculosis develops slowly and after various periods of latency. The period of latency may be one year or fifty years; therefore, one must not expect to see 25 per cent of the students who react positively to tuberculin on admission, or subsequently, present clinical lesions while in school. Indeed, only a small group will develop such lesions in the brief period of four years. However, if only a fraction of one per cent manifest such lesions all of the effort and expense to the institution in detecting these lesions long before symptoms appear or the disease becomes communicable, is well worth while. To fail to detect them is poor economy for the supporters of the institution. Moreover, they may be dangerous to the student body and the faculty and may even result in untimely death of the individuals.

Such students may develop shadows on X-ray films due to non-tuberculous lesions, such as small areas of pneumonia. Again, small soft-appearing shadows may appear and persist. When these are due to tuberculosis, one has to determine whether the lesion is of the first infection or reinfection type of disease. If the tuberculin test has only recently become positive, that is, within a period of three or four months, they are most likely due to primary foci which usually prove to be of no clinical significance. However, students who develop them should be kept under close observation, but should not be required to cancel their registration. Procedures like strict bed-rest and artificial pneumothorax are not indicated. When such shadows appear on the X-ray films of the chests of students who have been known to be positive to the tuberculin test for a period of six months or longer, they must be given serious consideration. However, if they are small and the student reduces his outside activities, many will slowly recede. If they continue to increase or evidence of excavation appears, there is no time to temporize. Although lesions may slowly increase and cause no symptoms over a period of two or three years, the sooner the spread of the disease can be stopped, the better; in other words, we should not wait for symptoms or the presence of tubercle bacilli in the sputum. For this group of students, we have found ambulatory artificial pneumothorax very satisfactory, since the collapse of the diseased area inhibits the prolifera-

tion of tubercle bacilli and stimulates the formation of scar tissue.

Pleurisy with effusion occasionally develops among university students. Although tuberculosis is not the only cause of this condition, it must be strongly suspected in every case not immediately preceded by or accompanied by acute respiratory infection such as pneumonia. At one time, tuberculous pleurisy with effusion was considered a primary condition, since pleurisy was often the first external manifestation of tuberculosis. We now know that pleurisy with effusion is a reinfection form of disease. The primary focus in the lung is usually located immediately subjacent to the visceral pleura. From this area, lymph flows from the lung into the lymph channels of the visceral pleura, and from there to the hilum region. Bacilli liberated from a primary focus may be carried into the lymph channels of the visceral pleura and the pleura being highly sensitized, intense reactions occur which result in an over-production of serous fluid which accumulates in the pleural cavity. In most cases of pleurisy with effusion, the X-ray film does not locate the primary focus in the lung or present any other evidence of parenchymal disease. One aspirates, except for diagnostic purposes, only in cases with severe toxic manifestations or when fluid is present in such volume as to cause pressure which embarrasses cardiac and respiratory functions. Usually, the fluid absorbs in a few weeks to two or three months; but evidence of adhesions manifested by the obliteration of the costo-phrenic angle may remain. Again, there may be no evidence whatsoever of the previous existence of effusion. If, when the fluid is present, there exists evidence of reinfection type of pulmonary tuberculosis, removal of the fluid and continuation of the collapse of the lung by artificial pneumothorax is indicated. If this is not done, the visceral and parietal layers of pleura usually become adherent after the fluid absorbs, thus obliterating the pleural space and precluding subsequent treatment of the pulmonary disease by artificial pneumothorax.

All students who give histories of having had tuberculous pleurisy with effusion and those who develop the condition in the institution should be informed of the potentialities of this condition. Despite apparent good health at present, they are in considerable danger of falling ill at some subsequent time from clinical tuberculosis of other organs of the body, particularly the lungs. Therefore, not only during their stay in the institution but also throughout life, they should have careful periodical examinations.

The health service staff must constantly keep in mind that not all clinical lesions which develop in the bodies of positive tuberculin reactors are in the lungs and pleura. The bones and joints, the kidneys, and other organs may be involved with progressive tuberculosis, while the lungs remain clear.

For instance, a student who reacted positively to the tuberculin test on entrance to a university, gave a history of having the right index finger operated on for tuberculosis of the bone twenty years before, at the age of seven years. While in school he reported with symptoms ref-

erable to the urinary tract. Careful examination revealed extensive tuberculosis of one kidney. Since nephrectomy was performed, he apparently has been in excellent health, and the X-ray films have remained clear.

When the original infection occurs, primary foci are often laid down in various parts of the body. All such foci may remain under control throughout the lifetime of the individual. Again, a single clinical lesion may appear at any time in life and there may be a sequence of events manifested by clinical lesions in various parts of the body. The citation of the following exemplifies this:

In 1925, a woman had a diagnosis of tuberculosis involving the upper lobe of each lung. She was treated over a considerable period of time, and finally the phrenic nerve was interrupted on the right side. The pulmonary disease was controlled and she was restored to a normal life. However, in 1937 she developed a small but definite tuberculous lesion in the right kidney, which required nephrectomy.

Another case is that of a student who had been tested on numerous occasions but never had a positive tuberculin reaction until April, 1931. In April, 1931, he had tuberculosis revealed by biopsy of the left supra-clavicular lymph node. A little later, a lesion was found in the apex of the left lung. There was evidence of disease in the apex of the right lung in June, 1931, and tuberculous epididymitis appeared in August, 1931, which required surgery. In February, 1932, a diagnosis of extensive tuberculous peritonitis was made and in April, 1937, tuberculosis was found in the right cuboid bone and adjacent structures which required surgery.

The acute and highly fatal forms of tuberculosis, which may involve other parts than the lung, particularly meningitis and generalized miliary disease, may appear at any time in positive tuberculin reactors. Meningitis is the result of an old focus in or adjacent to the central nervous system which later discharges large numbers of tubercle bacilli into the subarachnoid space or the ventricles of the brain. Generalized miliary tuberculosis is often caused by a lesion of the primary complex which ruptures directly into a large lymphatic duct or a blood vessel so that large numbers of tubercle bacilli are disseminated throughout the body.

We have recently seen a woman of forty years, who twenty-three years ago during college age, had pleurisy with effusion. After a brief illness from the effusion, she was apparently well, except for a mild attack of dry pleurisy, for twenty-three years, when she suddenly fell acutely ill and was found to have generalized miliary tuberculosis.

The program we have discussed begins with the freshman class and is carried through the senior year. In institutions which have not previously had a tuberculosis control program, it would be well to begin by examining the entire student body, if funds are available. The program we have outlined is applicable to high schools, industries, etc.

Treatment of Tuberculous Students Who Re-enter Schools

Some of the students who bring their disease under control later re-apply for admission to school. If at the time, they have no cough and negative sputum so that they are safe associates for students on the campus, they may be admitted. However, at this time the health service staff should make entirely clear to them that tuberculosis is a relapsing disease, so that there is considerable danger of reactivation of the old lesions or the development of new lesions in one or both lungs or in other parts of the body. Therefore, such students must cooperate in reporting to the health service staff periodically. This is important not only from the standpoint of the individual's health, but also from the standpoint of contagion on the campus.

At the University of Minnesota, many students have entered or re-entered after periods of treatment which were adequate to bring the lesions under control for the time being. Most of them have been cooperative to the *nth* degree, but for the occasional one who refused or neglected to report for periodic examinations a provision has been made which practically guarantees periodic examinations. When such examinations are due, the health service sends the student a notice. If he fails to report, another is sent; next a letter is mailed to his parents; and finally, the dean of his school is notified, which usually results in exclusion from all classes until the health service requirement is fulfilled.

A few students who after diagnoses of tuberculosis, were required to cancel their registration, re-registered a few months later, but without having their disease adequately treated. Inasmuch as they had previously passed the students' health service entrance requirements, the health service staff had no knowledge of their re-entrance to the school, and they continued over long periods of time with no examination, since the original admission health examination had been made. Such hazards on the campus have been overcome, for the most part, by a letter from the director of the health service to the registrar when any student leaves school because of tuberculosis, to the effect that that student is not to re-register until he has been adequately examined and recommended by the health service staff.

We have seen some most encouraging results among students who have been treated for tuberculosis and who re-entered the university. For instance, a student who was found to have pulmonary tuberculosis with a positive sputum in the fall of 1920 was sent to a sanatorium. Subsequently, while still in the institution, he developed tuberculosis of one knee joint. This, together with other complications, necessitated an eight-year period of hospitalization, following which he spent two years convalescing at home. Ten years to the month from the time he cancelled his registration, he re-entered, reported at once to the health service, and was most cooperative until he was graduated. He then procured a good position where he did excellent work. At present he is taking a year of graduate instruction but continues to have frequent periodic examinations.

Another student who fell ill from tuberculosis in 1927 was sent to a sanatorium. Her disease was limited to the right lung as far as could be determined by examination. While in the institution, the right phrenic nerve was evulsed. She later re-entered the university and reported periodically for examination. The disease remained under control throughout the remainder of her course. However, after she had entered the teaching profession, reactivation occurred and ambulatory artificial pneumothorax was instituted. This treatment has been continued, and she has lost no time as a teacher.

Some students who seek admission or re-admission to school have already had artificial pneumothorax instituted by their physicians. If the student lives in close proximity to his physician, we prefer that he continue the treatments with him but always require periodic examinations at the health service or reports from his physician. If the student is located remotely from his physician, treatments may be administered at the health service, provided this is the physician's desire. During vacations and upon graduation students are advised to return to their physicians. In fact, throughout the entire residence of the student who develops tuberculosis, an attempt is made to coöperate with the family physician. Such a case is that of a student who was found to have progressive pulmonary tuberculosis in the fall of 1937. She had practically no symptoms, and her sputum had not yet become positive. She was told that there were two courses which she might take, either one of which we could recommend: the first was to cancel her registration, become a strict bed patient at home under the care of her physician, or, if he desired, that she enter a hospital or a sanatorium; the second, that she remain in school and an attempt be made to institute artificial pneumothorax. She was asked to consult with her family and her physician before making a final decision. The next day this student, her mother and father, and the family physician who lived a hundred miles away, arrived at the health service. The situation was discussed in detail and all agreed to have artificial pneu-

mothorax instituted while she remained in school. Since that time, reports have been sent to the doctor, and she will be advised to see him during each vacation period. In this manner, the family physician keeps in close touch with his patient, and, when she graduates, he will continue with her treatment and periodic examinations.

The entire program of diagnosis, observation, and treatment of tuberculosis in our institutions should be aimed at, first, keeping the environment of the institution free from liberated tubercle bacilli; second, control of the disease of the individual so he can then or later pursue his educational activities. After all, the responsibility of the health service staff does not end when the student is graduated and the success of the staff should be determined, in some degree, by the subsequent developments among the alumni whom they have treated. In rehabilitation of the tuberculous, the student health service staff has an opportunity to play an active rôle. Since we have very little scientific data on the cause of subsequent reactivation of lesions and the appearance of new lesions, avoidance of physical and mental strain should be advised for the student who has had clinical tuberculosis. Therefore, if the student is contemplating a course or is already pursuing a course of study which leads into a field where there is a health hazard, the medical staff is justified in recommending a change of course.

There are few groups of physicians who have greater opportunities in health education than the staffs of our health services. The intimate contact with students who actually develop lesions or those who report to the health service for information is an ideal situation in which to further health education. In addition to this, articles in the students' paper are read by large numbers of students. Graduates become influential citizens in their communities in many parts of the world. If we take advantage of the opportunities to give them the proper instruction in tuberculosis, in particular, and good health in general, these alumni will aid in the eradication of tuberculosis and the improvement of the general health of their communities.

The Value of Iodine and Gold in the Treatment of Alcoholism

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FOR MANY YEARS, alcoholism has required a rational and scientific medical approach. For lack of such an approach, the alcoholic has been often left to the "reformers" and to the charlatans.

The first step toward the modern conception of the condition consisted in slowly progressive recognition of the fact that it is a disease entity characterized by a definite symptomatology and by constant pathologic findings both during life and at autopsy. This recognition began with the pharmacologist Schmiedeberg, who definitely determined that alcohol is a narcotic, not a stimulant. Overton and Meyer, whose voluminous works on many pharmacologic and physiologic chemical problems are classic, later found that narcotics (including alcohol) act as solvents of the myelin and other lipoids of the brain and nervous systems. Verworn went farther and ascertained that oxidation in the cells is impaired, so that the individual cells are asphyxiated. Bancroft and Richter confirmed what had already been found, that the process is essentially coagulation of the cell biocolloids. The net result is the fibroses and sclerosis, especially of brain, nerves, liver and kidneys, that are found at autopsy. Another constant finding in chronic alcoholism is enormously increased intracranial pressure and the presence of foreign globulins in the spinal fluid. This is the basis of the modern treatment of delirium tremens by spinal puncture, as discussed in the *Journal of the American Medical Association* early in 1937 and from time to time during the past few years in other journals.

As a disease, therefore, chronic alcoholism presents the following: specific affinity of alcohol for brain and nerve tissue, in which it causes absorption of myelin, degeneration of the medullary sheath, asphyxiation of cells through coagulation, and impairment or destruction of function in the axis cylinders; lowered cell metabolism, lowered basal metabolism, with sclerotic and fibroid changes in vital organs. Professor Haven Emerson of Columbia deals with these changes at length in numerous papers.

In all conditions marked by lowered metabolism, condensation of cells and fibrous or hardening changes, iodine has long been the remedy of choice. It has a dispersive effect in such states, a term that biochemists prefer to the older term, "alterative", as more correctly descriptive of its action upon cell colloids. To this property are added its important rôle in all cells, both plant and animal, though present in excessively minute amount. The use of iodine chiefly as potassium iodide in chronic alcoholism is not, therefore, new.

However, iodine alone does not meet all the conditions. Based upon the slight benefit obtained with gold salts in such hopeless conditions as *tabes dorsalis*, Landrey's paralysis, general paralysis of the insane, and similar conditions, gold salts were used in chronic alcoholism as long ago as 1885. Searle, in his book on "Colloids in Health and Disease," noted the usefulness of gold and iodine in alcoholism. Hare included gold in his text book near the close of the last century. Oliver Edwards, in 1896, published the results of treatment with gold salts in chronic alcoholism, and described thirty successful cases in detail, covering one year of observation. Crowder corroborated his work.

To these must be added the thesis of Kalmanovitch before the Paris Academy, Nardi's paper in the *Gior. Ital. di Derm.*; of Wigley, Carrol Wright, S. Lyle Cumins, Dore, Corsi, Roxburgh, in the *Proc. of the Roy. Society*; Henins and Weiler, *Biochem. Zeitschr.*; all dealing with gold in miscellaneous infections; papers by Oschner and others on gold in inoperable cancer, numerous titles in the German journals on gold in both diseases of the central nervous system and general constitutional states. In some hospitals, gold is used in certain brain cases, and an interesting study has been made at the Post Graduate Hospital of New York upon the distribution of colloidal gold in cells and tissues.

From these and other sources it would seem that gold possesses special affinity for cells, especially those of the brain and nerves, acts as a catalyst in repair processes, and possesses remarkable sedative properties, without, however, impairing the power of the nerves to transmit impulses, as is the case with chloral, bromides, and paraldehyde, for example. Sedation is apparently effected through some coordinating or stabilizing action.

Probably utilization of material and research failed to develop further primarily because of the toxic and irritating qualities of ordinary iodine and gold preparations, which usually would prevent the administration of large enough amounts over a sufficiently long period required to give material benefit to the patient. However, once Colloidal preparations of sufficiently high quality (the necessity for such high standards being noted by Searle, Sir Malcolm Morris, and others), were available, then science was ready to fulfill Bechhold's prediction (in his textbook "Colloids in Biology and Medicine") that possibly the proper treatment for alcoholism would be found in the Colloidal field.

Therefore, iodine and gold with their known physiologic action meeting the physical indications, but reduced to colloidal form, would seem indicated as con-

structive agents with which to counteract the previously noted important abnormalities created by the excessive use of alcohol.

The colloidal state is preferred because it is the physiological form, the activity is greater, absorption is practically complete and is prolonged, much smaller doses are required, the effects are constant, toxicity is greatly diminished or is abolished altogether, and the treatment can be continued uninterruptedly over a long period. For example, the statement is made under authority of the University of Wisconsin that the only instances of poisoning by colloidal gold are those in which unconverted chloride was demonstrated. Colloidal iodine has been used continuously both here and abroad for from several months to a year without iodism. The advantages of colloidalness are scientifically detailed and demonstrated by many highly technical works dealing with the subject both pharmacologically and chemically. We may note, for example, the voluminous writings of Handovsky of the University of Gottingen, Kopaczewski of the Institute of Belgium for Advanced Studies, J. Uri Lloyd, Tait, Fisher of the University of Indiana, Richet, Doerr, Warfield, A. Lumiere, Le Duc of the Nantes School of Medicine, and especially the great textbook of H. Bech-

hold, while professor of Internal Medicine at Leipzig.

In the early stages of the clinical work with these medicaments, it was found that ordinary straight colloidal iodine was still too volatile and toxic for use with alcoholism. Special methods of manufacture were developed until toxicity was eliminated for all practical purposes. (During three years of clinical use there have been only three doubtful cases reported where even a slight runny nose or watery eyes were noted, none with a rash or other positive symptom.)*

Clinical results over a period of three years would seem to justify the theories of the action of Colloidal Gold and Colloidal Iodine in Chronic Alcoholism. We find one necessary part of the alcoholic's rehabilitation, namely, the normalization of his physical condition, practically completed. Complete rehabilitation involves more than this. Such further adjustment belongs to the psychiatrist—at least it is outside of the field of what can be done by a therapeutic agent—and consists of a readjustment of psychic and mental factors. The importance of this phase of the treatment should not be minimized.

* The medicaments used in these studies were obtained from Plasmotropin Laboratories, New York.

Does Our Physical Activity Program Function as Health Education?*

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WE HAVE been told by many authorities that the aim of health and physical education should be the same as the aim of education. In other words, the aim of any part should be the aim of the whole.

In 1929, Prof. L. T. Hopkins quoted as many as sixty various aims of education, which he classified as follows: education as *culture*; education as *discipline*; education as *growth* or *adjustment*; and education as *preparation for life*. Or as one writer has summarized it, "education should aim to help the individual realize his own best self." With most of these general statements of aim and purpose we are in full accord, but, nevertheless, find ourselves frequently confused by a difference of opinion on questions of administrative objectives, values, standards and policy.

It is not my purpose to offer a solution to any specific problem in this area of education, but merely to examine what is being done in one residential college. One phase of our health educational program has to do with adequate energy outlets as furnished by required physical activity, intramural and intercollegiate athletics. I wish to examine these activities in regard to the health

benefits that supposedly accrue to the individual participant.

The fundamental purpose of any health program is the improvement of physical and mental health, and the education of the student body in the essentials of healthy living. Today we think of health as a condition of well-being which embraces physical, mental and emotional hygiene, and which to a very large extent controls personal and social behavior. We are convinced of the values, both physical and social, inherent in competitive athletics and other physical activities properly conducted. The value to the shy and diffident freshman of the contacts and opportunities for enlarging his acquaintanceship with his fellows, afforded by routine participation in various forms of exercise and games is difficult to overestimate as a factor in promoting satisfactory and healthy adjustment to a new experience. The need for relaxation and play activities in the high-powered life of modern times is quite obvious. Almost daily we see or hear about individuals breaking down because they have not learned that leisure time well-spent is a necessity for the maintenance of a healthy and well-balanced life. There is no big worry or physical strain behind these pictures of poor health; but investigation usually shows a history of inadequate recreational outlets and a lifelong inability to relax. One of the healthiest characteristics of play is the fact that real play is not solitary. It is not good for anyone to work or play too much alone.

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As grown-ups, we live in a world with other people, and our success or failure depends largely upon our ability, not only to get along with other people, but actually to enjoy group contacts. It is for these reasons as well as the physical benefits, that our freshmen are required to take part in physical activities suited to each one's taste or needs as shown by a medical and physical examination. At the same time, consistent effort is made to encourage students in upper classes to engage in some sport activity of their choice.

Recently, we have made a number of studies to determine the extent to which undergraduates take part in physical activities—the three upper classes having a freedom of choice and being on a largely self-directed program. These studies indicated that approximately 90 per cent of the students appeared on the records as participants in some form of organized exercise or sport. The record of each season, fall, winter and spring, was studied separately to show who did and who did not take part in the activities represented. For example: in the class of 1939 (freshmen required) there were no inactive throughout the year; in the class of 1938 13 per cent were inactive; class of 1937, 18 per cent; class of 1936, 19.6 per cent.

TABLE I.

Class	No. Enrolled	Not Participating	Per Cent
1936	519	102	19.6
1937	528	97	18
1938	613	81	13
1939	625	0	0
2285 (in college)		280	12.2

The record for the junior and senior years confirms the impression gained from a previous study of intercollegiate participation that pressure of scholastic work tends to limit the amount of time spent in organized sports and games. It is a known fact that a certain number of the 12 per cent who did not take part in organized sport activities did keep themselves in good physical condition by individual workouts in the gymnasium, swims, hikes, pick-up games, *etc.* It is quite likely, however, that many of these men did little or nothing.

Physical Activities Program

I. Required Physical Activity.

As a result of the health examination and physical efficiency tests given to 635 students in the class of 1940 (freshmen), 354 were classified "A" and 281 were placed in lower classifications. During the year, as a result of supplementary tests following one or more periods of required work, 219 were promoted to "A", making a total of 573. The majority of this group were permitted to select their activity on a choice-interest basis. However, the administration of this requirement has always placed emphasis upon encouraging the student who was physically fit to go out for one of the team sports in which he might be interested, or which he might be induced to take up as a new experience. This policy is based on the theory that, physical condition permitting, personal contact team sports under competent instruction make a more useful contribution to the general development of the freshman than do non-

contact individual activities. Freshmen are given every encouragement and facility for acquiring some skill and experience in certain sports that have carry-over value after graduation, such as tennis, golf, squash, fencing, *etc.*

Fifty-five of the freshman group were classified C Medical, and were given the benefit of special medical supervision and planned individualized programs. The response of this group is one of the most encouraging from the point of view of health benefits, and I should like to cite two cases as representative:

T. G. entered the university in the fall of 1932. He had poliomyelitis in 1920, at age 5. At first, the paralysis involved all but his head. He later recovered all functions except those below the knees, where there was more involvement on the left than on the right. Two surgical operations were unsuccessful, and not until a successful third one in 1923 was this lad able to walk with the aid of braces. Although discouraged, he had an indomitable spirit and was determined to overcome his handicap as far as was humanly possible. A member of the physical education staff became interested, and gave him encouragement and a system of exercises designed to strengthen the weakened muscles. By painful and slow degrees this boy proved that a former physician who had said he would never walk, was wrong. He tried out for the gymnastic team, and during the junior and senior years became the intercollegiate champion on the side horse and rope climb. At the present time he holds the world's record for the rope climb at 3.8 seconds. He was graduated last year with highest honors in his class and this year he is enrolled in the University of Pennsylvania Medical School.

J. R. H. entered the university in the fall of 1937 from a large high school where he had been an outstanding student. Nervousness and fatigue in sports during his senior year had been blamed on his heart. This had a profound psychological effect, because his father had died of heart disease in 1934. Consequently, he was a cardiac invalid with a keen but disturbed mind, holding a large scholarship in the university. The entrance examination revealed a normal heart, slightly irritable, and he was encouraged to enter an individual activity class for mild exercise. Just before the mid-term scholastic tests he returned in a highly nervous state. He was contemplating dropping out for a year to rest, and would have done so except for the loss of the scholarship which he needed badly. Examination in this emotional state showed no appreciable change in the heart picture. He was assured that his heart was normal. Friendly advice along scholastic lines bolstered his confidence in his mental abilities. He was temporarily excused from exercise to devote more time to his studies and asked to report after the scholastic tests. He returned, radiating thanks, and demanded that since his heart was all right, he be permitted to take up his favorite winter sport, fencing. This request was granted and he is carrying on very happily and successfully.

II. Intramural Sports.

Intramural sports were introduced to Princeton in 1873 by George Goldie, the first athletic director. Their

object was to supplement the contests then in vogue with a track and field-meet open to everybody in college. These contests were called the Caledonian Games, in honor of Mr. Goldie, who at that time held the Caledonian championship in all-around athletics. They have been held annually, except during the Great War, since 1873. It is a remarkable fact that these games and the Cane Spree were practically alone in commanding the continued support of the students during the long period which was increasingly dominated by intercollegiate contests.

In 1911, an Intramural Athletic Association was formed to promote a general athletic system for those students not on varsity or freshman teams. Backed by student interest and initiative, the officers of the Intramural Association have been uniformly active and co-operative in the work of extending the number and scope of the competitions far beyond their original program, and in recent years even beyond the capacity of the facilities, indoors and out, that the university has been able to put at their disposal. It has been the policy of the department officials intimately in contact with this work to keep organization, as such, on the lowest terms consistent with the adequate supervision of making and playing the various schedules—in other words, to reduce "red tape" and official interference to a minimum, and to preserve self-government among the student groups. The validity of this attitude is demonstrated by the rapid growth and healthy condition of the intramural system today.

The intramural report for last year shows that tournaments and other competitions were conducted in 23 sports, with 227 individual teams competing in 769 team contests. A total of 3,390 student contestants took part in this sports program. Touch football continues to be the most popular intramural sport as evidenced by the fact that 518 upperclassmen participated in this sport during the fall. Eighteen hockey and 55 basketball teams form the nucleus for the intramural winter sport season. The many-sided intramural program provides a wide range of choice to attract men of different athletic capacities and taste. It is a fun-producing activity which offers a healthy recreational outlet without the emotional pressures so prevalent in the highly-organized and complex team competition of intercollegiate sport. In our experience, the number of injuries among intramural contestants is relatively small and most of those occurring are minor in nature.

The amount of money required annually to carry on this program is much less than might be supposed, as is shown by the fact that the present intramural participation is maintained at a cost of less than \$2,500.00 a year.

III. *Intercollegiate Athletics.*

Intercollegiate athletics properly controlled and supervised have a legitimate place in the field of physical recreation. The emphasis here is on instruction and competition. Unfortunately, because of lack of funds and facilities, only students of superior ability benefit from this phase of the program. The ideal would be to fur-

nish the same opportunity and experience for all students.

Last year 62 varsity and freshman teams with 1,374 (950 individuals) squad members, playing in 43 sports, represented the university in 377 intercollegiate competitions. This record might be reviewed from several angles, but I wish to confine my remarks to the medical and surgical reports of the team physicians.

Three physicians are assigned to the various athletic squads and their function is to give special examination to candidates at the beginning of each sport season; to be present at all contests and care for any injury or illness that might arise among the contestants. There were 402 cases of injury or illness during the year, and 33 candidates who were found to be physically unfit for the sport of their choice were advised to discontinue vigorous activity. The aggregate number of days lost from injury or illness was 2,160.

This record is fairly representative of those covering the past five years. Boxing and football are the most formidable from the standpoint of injuries. In the case of boxing, we have a sport in which the rules permit the opponent to strike the head. Not only do the rules permit it, but four out of every five blows are deliberately aimed at the head, because it is the most vulnerable spot for a quick knock-out and victory. This style of victory is the aim of practically every boxer who steps into the ring, and college students are no exception. The knock-out means unconsciousness, and unconsciousness means a precarious state from which serious brain complications may arise. College courses and careers have hinged on this condition which the rules of boxing permit to happen. The argument that concussion occurs in other fields of intercollegiate sport cannot be denied. But the difference is, that in one case they are deliberate and permitted under the rules, whereas in the other they are largely accidental and if deliberate, represent infringement of the rules. As a result of our experience, it was decided to discontinue the sport because of the inherent danger of injuries of more than accidental nature, as well as a lack of interest on the part of students, both as competitors and spectators, and the difficulty of securing qualified officials.

In football, the shoulders, knees, ankles and head are the points most frequently involved. That these injuries should and do receive the most expert attention, from both the preventive and therapeutic standpoint by the team physician, trainers and coaches is apparent. Yet the discouraging fact remains, that, starting with several hundred healthy, superior athletes, as the season progresses, there is left in its wake a toll of injuries that is comparable to a small war. If this activity is to produce the health benefits it is capable of furnishing, we must seriously concern ourselves with the obvious causes: inadequate conditioning before heavy contact work; better coöperation between team physician, trainers and coaches; elimination of internal and external pressures; and finally, we should give the game back to the students with freedom and relaxation and avoid further exploitation of those participating in one of the

TABLE II.
MEDICAL AND SURGICAL SUPERVISION OF ATHLETIC TEAMS

SQUAD		No. Men on Squad	Men Hurt or Sick	Injury	Days Lost Illness	No. of Cases	Advised to Drop
VARSITY							
Football		83	65	469	8	114	11
150 lb. football		67	32	130	10	41	3
Cross country		17	1	12	0	1	0
Soccer		45	7	29	5	7	0
Basketball		28	9	35	12	12	0
Hockey		39	13	11	5	22	1
Wrestling		36	11	93	21	12	0
Gymnastics		11	2	10	3	2	0
Swimming		31	12	0	57	14	0
Fencing		13	1	7	0	1	0
Boxing		20	8	13 + 6 D	0	8	6
Polo—indoor		8	1	0	0	1	0
Polo—outdoor		17		No illness or injury			
Squash		13	2	12	30	2	1
Baseball		40	7	12 + 1 D	0	7	1
Track—indoor		56	3	21	13	3	0
Track—outdoor		61	10	77	60	10	1
Crew		40	4	11	5	5	0
150 lb. crew		49	1	0	4	1	0
Lacrosse		51	9	38 + 1 E	3	11	0
Tennis		26		No illness or injury			
Golf		14		No illness or injury			
Rugby		30	4	53	0	5	0
		795	202	1033	236	279	24
FRESHMEN							
Football		80	52	445	44	68	7
Cross country		15		No illness or injury			
Soccer		39	6	59	0	6	0
Basketball		19	5	5	16 + 1 D	7	1
Hockey		28	3	2	0	3	0
Wrestling		26	6	37	2	6	0
Gymnastics		9	6	122	0	8	0
Swimming		33	10	0	46	10	0
Fencing		29		No illness or injury			
Polo—indoor		9	1	3	0	1	0
Polo—outdoor		9		No illness or injury			
Squash		11		No illness or injury			
Baseball		42	1	5	0	1	0
Track—indoor		34	1	25	0	1	0
Track—outdoor		66	4	48	0	4	1
Crew		35	3	9	0	3	0
150 lb. crew		42	1	5	0	1	0
Lacrosse		37	4	13	5	4	0
Tennis		13		No illness or injury			
Golf		12		No illness or injury			
		579	103	778	113	123	9
SUMMARY							
No. of Teams 62	No Sports 43	No. of Competitions 377	All Squads 1374 (950 indiv.)	No. Men Hurt or Sick 305	No. of Cases 402	Days Lost Injury 1811 Illness 349	Advised to Drop 33

D = Dropped E = Dropped at end of season.

grandest games of all history.

General Suggestions and Conclusion

1. *Conditioning*: Summer conditioning when practiced, has done a good job for us. However, it is a hit-or-miss proposition depending upon the individual boy. Since the toll of injuries is usually heavy, in the pre-season period a full three weeks should be devoted to pre-season conditioning. Dr. McPhee, after many years of experience as team physician, suggests that during the first week the physical activity periods in the mornings and afternoons be given over to stiff calisthenics, speed games, falling properly, ball-handling (as passing, kicking, receiving and carrying), and some controlled tackling. During this week of conditioning, no heavy equipment with pads, etc., should be used.

He says, "This may be all folly, but it is my belief the squad would be in better physical condition as a whole and would have more balanced control of their bodies for the arduous task ahead of them."

2. *The Athletic Trainers* should be under the control and supervision of the team physician, because the health of the student is the responsibility of the university and this responsibility has been delegated to the medical

service. Such an arrangement would facilitate coordination of training staff and their program with the best practical standards of treatment procedures. It would be the function of the trainers to inform the team physician of any case of injury or ill health, to carry out the physical work as outlined by him, and discuss any personal ideas of treatment or prevention with the team physician before putting them into practice.

3. *The Psychological Hazards* incident to the external and internal pressures centered around football create a most difficult situation for all concerned. Tension-states on the part of the public, alumni, coaches and players neutralize many possible health educational benefits. When a recent well-known all-American player writes that his best performance was a result of relaxed play, it would seem that freedom and relaxation should be given a more important place in the training régime.

In describing our record of experience in the field of physical activity, no attempt has been made to solve any particular problem or emphasize new procedures. We merely suggest an analysis of the strong and weak points in the program in the hope that it may stimulate thought and furnish a basis for planned and intelligent improvement.

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MINNEAPOLIS, MINNESOTA, JUNE, 1938

A NEW ERA DAWNING FOR HAY FEVER SUFFERERS

A new era in the history of hay fever is dawning. The recent organization of a committee on Aerobiology, an interdivisional committee of the National Research Council, gives promise of filling in the gaps of deficient knowledge which have hindered the management of hay fever cases on a scientific basis.

Sixty-five years have passed since Blackley furnished the first proof that the condition of hay fever is caused by inhalation of pollen polluted air. During this time almost every kind of plant has been accused by someone or other, and many of them unjustly. Through the years progress has been made, but actual practice lags far behind potential possibilities.

While almost every land plant is a producer of pollen, by no means are all polluters of the atmosphere. Scheppegrell as early as 1917 called attention to this fact, and pointed out that only those plants regularly pollinating through the agency of wind are of importance in connection with air pollution and hence with hay fever. Much information is still widespread among doctors and laymen alike. It is discouraging at the present stage of progress to hear of such plants as roses, dandelions, goldenrod, *et al*, mentioned in connection with hay fever.

The syndrome of hay fever is due to the existence of a condition of allergy to specific substances residing in the pollen grains, the chemical nature of which has not yet been positively identified. Although there are liter-

ally hundreds of weeds producing air-borne pollen, there is much evidence that the exciting substance in the pollen of plants standing close in relationship is identical. It is hoped that at some future date chemistry will definitely identify these substances, thus removing some complexities from the problem.

The application of pollen to the skin as a test of sensitivity was first done by Blackley in 1873 and has become an established technique for diagnosis. It does not seem to be generally known, however, that skin sensitivity does not always coincide with sensitivity of the nasal mucosa.

Reasonable accuracy in the diagnosis of the cause of the hay fever syndrome for an individual patient necessitates a complete knowledge of the pollens polluting the air at the period coinciding with the symptoms. In the past there has been much guess work and, due to incomplete knowledge, justifiably so. Such practice is, however, no longer justifiable. Methods have been developed which make it possible to determine with great accuracy not only which pollens pollute the air but also the relative proportions of each. There is no longer excuse for lack of complete knowledge concerning atmospheric pollen pollution. Through an intensive study extending over a period of five years this information has been accumulated with great exactness for the Twin Cities area and, to a lesser degree, for other localities. Such studies as these are, however, local in character, and such information cannot be carried over to other localities.

The scope of application of these methods should be extended to a nation-wide basis. That hope for such accomplishment is not an idle dream, is presaged by the recent organization of the committee referred to above. While this committee is interested in many other phases of aerobiology than that of pollen pollution, the proposed central laboratory will offer valuable services to practicing physicians as well as institutions through the conduction of air pollution investigations in connection with hay fever studies. Ultimately we may expect that accurate data will be accumulated for the entire United States of America, which is so essential to the satisfactory treatment of hay fever. In addition, such information would serve: (1) to guide hay fever sufferers for whom their specific offenders have been determined to areas where the specific offending pollens may be avoided; (2) to serve as a basis of operation of any campaign of weed eradication, directing a concentration of effort toward those species of greatest importance.

R. V. E.

A. M. A. MEETING

The American Medical Association meets this year in San Francisco, June 13-17. The meeting promises to be of great scientific interest. Some 200 papers will be presented before the fifteen sections of the Association; an impressive list of 155 titles has been announced for the scientific exhibits. The general practitioner and specialist as well will find numerous activities of great importance to him packed into each day's program.

Conventions such as this serve as intensive short courses in what is new in medicine. Attending these five days of meetings and exhibits is equivalent to hundreds of hours spent in a medical library. Physicians are able to catch up with the stream of medical progress; they get first-hand reports from the outposts of medicine.

The contact with a large number of men in the same profession is very stimulating. It is practically impossible to keep abreast of medical affairs without this contact. No amount of reading can impart the spirit of medical research so easily found at a large medical gathering.

R. B.

SOCIAL MEDICINE DISCUSSION

Our February issue was devoted to papers written by Fellows of the American College of Physicians, introduced by a letter from the President, Dr. James H. Means. With his presidential address to the College at its annual session in New York in April, Dr. Means again made the front page. The *New York Times* reported him as criticizing the American Medical Association for its "partisan behavior and something close to stand-patism."

One physician has written that he approved of the present policy of the American Medical Association in studying all plans for the wider distribution of a high standard of medical care with the view toward helping each community solve the problem and administer a program for itself. "But," he added, "it has been at it for the past eight years, and what has it accomplished?" We believe that this expresses the attitude of many loyal members of our associations throughout the country. The impulse is doubtless prompted by a recognition of the importance of organized medicine taking its first step. A little wrangling does no harm, but in justice to those who have devoted so much time to the matter, we must admit that it is more important that this should be the right step rather than a hasty mis-step.

A. E. H.

Book Notices

BUIE ON PROCTOLOGY

Practical Proctology, by LOUIS A. BUIE, A.B., M.D., F.A.C.S.; 1st edition, red cloth, gold-stamped, 512 pages (total), 152 illustrations of which 6 are in color, index; Philadelphia: The W. B. Saunders Company: 1938. Price, \$6.50.

Dr. BUIE, who is chief of the section on proctology of the Mayo Clinic, and professor of proctology in the University of Minnesota Graduate School of Medicine, describes each clinical entity in an orderly fashion. He includes definition, etiology, pathology, symptomatology, diagnosis, and treatment. Chapter Two is devoted entirely to the anatomic aspects of proctology. Whereas Professor BUIE discusses most of the conditions that will be met in general practice, he does not exclude gonorrhea, syphilis, lymphopathia venerea, anal sarcoma, rectal sarcoma, etc. Since complete examination procedures, patient preparation directions, office procedures, choice of anesthetics, etc., are given, this is a concise, well-written, complete work for general practitioner or specialist.

ROSE & CARLESS SURGERY

Rose & Carless Manual of Surgery, edited by WILLIAM T. COUGHLIN, B.S., M.D., F.A.C.S., from the 15th English edition by CECIL P. G. WAKELEY, D.Sc. (London), F.R.C.S., F.R.S. (Edinburgh) and JOHN B. HUNTER, M.C., M.Chir. (Cantab.), F.R.C.S.; 15th American edition, heavy blue buckram, gold-stamped, 1,536 pages plus index, no bibliography, 899 figures, several colored plates; Baltimore, Maryland: William Wood & Company: 1937. Price, \$9.00.

This great surgical work is a delight to behold and a very real fund of surgical information to read. The presentation of material is orderly; the textual matter is well-written; and all material is strictly up-to-date, and in line with American requirements—in itself no mean achievement of Dr. COUGHLIN, the American editor, who is professor and director of the department of surgery of St. Louis University. As a matter of fact, this work probably would be appreciated most of all by the general surgeon, who must master nearly all but the most esoteric technics of operation. Specialized surgery not uncommonly used is omitted. The late ALBERT CARLESS, by the way, was Lord LISTER's surgical assistant for years, and this fine surgical text is said to have been inspired by that greatest of all surgeons. THE JOURNAL-LANCET recommends this work,

Societies

SCIENTIFIC PROGRAM OF THE MINNEAPOLIS CLINICAL CLUB

Meeting of February 10, 1938

D. D. Turnacliſf, M.D., Presiding

THE SCHANZ OSTEOTOMY FOR UNREDUCED DISLOCATION OF THE HIP (Case Report)

MYRON O. HENRY, M.D.
MINNEAPOLIS, MINNESOTA

The following case illustrates the success of the Schanz subtrochanteric osteotomy in an adult having bilateral, irreducible, congenital dislocation of both hips. Various types of palliative operations have been employed during the past forty years to relieve the pain and instability of unreduced congenital dislocations of the hip; of the various types, the Lorenz bifurcation

sides. She sought relief from her pain, fatigue, and limp. X-rays revealed congenital dislocation of both hips with malformed femoral heads approximately two inches above and behind the shallow acetabula. Fig. 1a.

On August 27, 1935, a Lorenz bifurcation operation was performed on the right hip. The distal fragment was pointed into the acetabulum, but postoperative X-rays revealed that the point had not engaged in the socket. After the operative wound had healed, the hip was manipulated under the fluoroscope, but without success as the distal fragment could not be forced into the rudimentary socket. Because the bifurcation operation seemed doomed to fail, the hip joint was exposed at a second operation in order to clear the acetabulum of soft tissue sufficiently to receive the distal fragment. The X-rays were misleading, and not even a rudimentary socket existed, so the bifurcation operation was converted into a fairly high Schanz osteotomy. Fig. 1b. The patient made an uneventful recovery from the operations, and resumed walking with definitely improved stability of her hip.

Pleased with the result of the operation on her right hip, the patient returned a year later and requested the same operation on her left hip. Fig. 2a. On January 25, 1937, a



Figure 1a.
Unreduced congenital dislocation, right hip.



Figure 1b.
Same, postoperative.

operation seems to be the most popular. The Lorenz, or Lorenz-Bayer, operation is an osteotomy of the femur in a frontal plane calculated to allow the point of the distal fragment to enter the acetabulum and afford a solid pelvic support for the unstable hip. The bifurcation operation assures stability if the point of the distal fragment engages in the acetabulum, but the procedure limits the hip joint motion considerably.

The Schanz osteotomy also relieves instability, pain, and fatigue in cases of old unreduced congenital dislocation of the hip, but through an entirely different mechanism. When a patient with a dislocated hip bears his weight on the affected limb, the pelvis drops on the opposite side—a positive Trendelenburg sign. Due to the loss of acetabular support on the affected side, the pelvis necessarily drops on the sound side until its descent is checked by impingement of the pelvic wall against the shaft of the affected femur. Until this impingement becomes complete, stabilizing the pelvis, the opposite sound leg cannot be advanced. Schanz reasoned that angulation of the femur, just below the acetabulum, would produce such impingement earlier, or before the pelvis dropped, and so stabilize the gait. The Schanz operation angulates the femur so that its upper fragment lies permanently alongside the obliquity of the pelvis, and the distal fragment remains parallel to the opposite extremity.

Case Report

Mrs. J., 33 years of age, had unreduced congenital dislocations of both hips. She walked with a double hip limp, or "waddling duck" gait. There was sharp exaggeration of the lumbar lordosis, and Trendelenburg's sign was positive on both

typical Schanz osteotomy was done on the left hip (Fig. 2b), using rustless steel Schanz screw-pins through the cortex of each fragment, and controlling the angulation outside the cast by a Riedel clamp. The patient made a satisfactory and uneventful recovery from this operation as well, and now walks unaided. Trendelenburg's sign has disappeared on both sides, her legs are of equal length, most of her pain has disappeared, and she has a very satisfactory range of hip joint motion. According to her own statement "she now walks better than ever before."

The Schanz subtrochanteric osteotomy is an operation devoid of shock which gives marked increase in stability with relief from pain, without limiting the range of hip joint motion appreciably. Relief from pain and stability of gait are offered the adult sufferer from congenital dislocation of the hip by this orthopedic operation which deserves better recognition from the profession at large.

Discussion

Dr. MALCOLM HANSON: This case brings out a very important problem, that of the accurate determination of the depth of a poorly formed and extremely shallow acetabulum. I think that we may obtain a better evaluation of the existence and depth of the acetabulum by taking, in addition to the stereoscopic antero-posterior films, oblique films of the hip.

Dr. E. S. PLATOU: May I ask Dr. Henry how the age of the patient with such a condition affects the choice of operation?

Dr. RUSSEL MORSE: I would like to ask Dr. Henry whether this operation does not also correct a malposition of the feet,

correct the external rotation so that the foot is brought back into a straight line?

Dr. PAUL DWAN: I would like to know the incidence of complete absence of the acetabulum as found in this case.

Dr. O. J. CAMPBELL: I would like to ask Dr. Henry whether the procedure he described affects the length of the extremity. I would also like to know whether or not he uses the frontal plane for sectioning the bone or whether he removes a wedge.

Dr. M. O. HENRY: The age of the patient is very important—in a patient from the age of 10 to 18 with the same apparent acetabulum, we would attempt to pull the hip down and reconstruct a roof. In the patients who are past 35, some palliative operation such as the Schanz osteotomy is best. The roofing operation gives a longer extremity with a much more stable weight-bearing surface. The easiest and simplest operation of all is the bifurcation operation, but we reserve that for the patients who are not in good physical condition, although the Schanz operation is less mutilating.

The Schanz operation does not change the length. A double Schanz osteotomy is not a common thing, and we hesitate about doing it. In this instance both femora were displaced about

cedure that I know of, is that by adducting the legs so much there may be some tendency to knock-knee.

I do the osteotomy in the frontal plane because it is done from the side and the pins are put in at a predetermined angle, the exact number of degrees calculated beforehand on the X-ray. We do it in the frontal plane between the two pins, with a chisel. The Riedel clamp holds the pins and fragments perfectly. We cast them anyway because an orthopedic operation doesn't seem complete without a cast. The Schanz pins go through both cortices; the threads engage through the cortex. I put one in yesterday; the girl is sitting up in bed today and is surprised that she didn't have much pain. She had only one hypo since the operation.

About the feet—we improve the posture a little because usually the femur is angulated forward. In most all of these cases, there is an exaggerated lordosis with backache. The operation does not attack the rotation of the feet directly, but they are pretty well corrected as regards outward rotation.

I do not take out a wedge of bone, and have discontinued the notch on the distal fragment in the last two cases.



Figure 2a.
Unreduced congenital dislocation, left hip.



Figure 2b.
Same after Schanz operation.

as far as they could go and consequently this patient already had the maximum shortening. The angulation produces a little abduction and the patient adducts the legs to correct the abduction, which brings the center of weight-bearing more directly under the center of the body. The only criticism of the pro-

Someone asked about the incidence of the shallow acetabulum. (Dr. Dwan). All congenital hips have poor sockets and when we reduce them in children from a year to 3 years old, we are putting a mal-formed head opposite a mal-formed socket.

CRYPTORCHIDISM

R. L. WILDER, M.D.

MINNEAPOLIS, MINNESOTA

Paper published in May, 1938, issue of THE JOURNAL-LANCET

Summary

The development, migration and mechanism of descent of the testes was reviewed. The nature of the hormone influence of the interstitial cells and germ cells of the testes was considered in relation to the state of descent of the testes. Various possible causes of undescended of the testes were given, followed by a discussion of methods of treatment. Particular attention was given to the treatment of cryptorchidism using anterior pituitary-like sex hormone from the urine of pregnant women.

Discussion

Dr. E. S. PLATOU: I want to compliment Dr. Wilder on this presentation. The subject is one that all of us are interested in, I am sure. There are two or three things I would like to comment on: first, the high incidence of cryptorchidism as reported in many series must certainly include many spurious cases. Second, the statement made by Meredith Campbell that 90 per cent of testes which do not descend by the age of one year will not descend without treatment is perhaps open to

question. If his claim can be supported by good evidence, it would seem that we should start treating cryptorchidism much earlier than we have been accustomed to doing. More accurate diagnoses may alter these and many other conclusions drawn from the cases reported to date, it seems to me.

I do not recall that Dr. Wilder referred to the matter of the size of the testes and the effect hormone therapy may have in this respect. There are those who feel that the increase in size is especially important in the establishment of normal position.

Are there any really conclusive statistics relative to the incidence of malignant degeneration when the testis remains intra-abdominal? Hasn't this danger been greatly overstressed?

Dr. C. D. CREEVY: There is something about the male sex organs that makes it very difficult for physicians to discuss the surgical treatment of their ailments in an entirely rational manner. I do not know what the reason is, but the bitter conflict between the suprapubic and perineal prostatectomists, and more recently between the prostatectomists and the resectionists is an example.

There is a conflict of opinion in current reports as to what we can expect from anterior pituitary-like hormones. There have been series reported in which success has varied from as low as 10 to 15 per cent to as high as 90 and 95 per cent,

apparently with similar preparations and similar disorders. I think it is a little too soon to say how much can be expected from the hormones in the average case.

Physiologic ectopy should be excluded in the manner described by Dr. Wilder; in all cases in which the testis does not come down, anterior pituitary-like substance ought to be tried. I suppose the time will come when there will be more potent extract preparations of the anterior lobe itself which will be more effective than the present substances.

An interesting paper was presented at the last meeting of the American Urological Association by Thompson and Heckel of Chicago. They reported that, in addition to causing descent of the testes, it is possible to produce an enlargement of the penis by sufficient dosage of anterior pituitary-like substance; they suggested that it be used in hypospadias in young children to increase the size of the penis and thus facilitate operation. Apparently the enlargement disappears when the extract is discontinued.

The incidence of malignancy in undescended testes is easily worked out statistically by any one who is a better mathematician than I, from the incidence of testicular tumors and of undescended testes. It appears that tumors are relatively from 50 to 220 times as common in the undescended organ.

Bringing the testis down does not remove the predisposition to malignancy but simply puts the organ in a position where it can be felt. The patient can be advised as to the possibilities so that if a tumor develops it can be discovered early, before any symptoms would ordinarily be noticed.

The percentage of surgical cures of undescended testes depends upon how carefully the surgeon dissects out the vessels of the cord and fixes the gonad in a proper position without damaging the vessels. In one case, in which I did what seemed to me to be a very nice operation in a young adult, the testis atrophied almost completely, apparently because of damage to the vessels.

The testis does not necessarily become abnormal if left *in situ*. A few weeks ago I took out a large hypernephroma from a patient of 65. He had an inguinal hernia with an undescended testicle and had always worn a truss. When he was ready to leave the hospital his hernia came down and became tender and painful, and could not be reduced. I suspected that some omentum had become incarcerated in the sac or that metastases were developing. On exploration, a perfectly normal but undescended testicle was found. At the bottom of the hernial sac was an inflammatory mass which the pathologist could not identify satisfactorily. The point is that this testicle looked perfectly normal although it had been in the abdomen for some 65 years.

DR. WILLARD WHITE: A few years ago I read a paper written by Dr. C. B. Drake of St. Paul ("Spontaneous Late Descent of the Testicle," Jour. A.M.A. 102:759-761, March 10, 1934.) Dr. Drake had examined boys in a school in St. Paul and had an opportunity to re-examine them from year to year, and kept records. The age of these boys varied between 9 and 19. There were eleven boys with an undescended testicle and one of these boys had a bilateral undescended testicle making therefore, in all, twelve undescended testicles. Ten of these twelve descended spontaneously at or near puberty. Dr. Drake stated in his article that he corresponded with other physicians who examined boys in private schools where the ages were comparable and where repeated examinations could be made and records kept. He mentioned that Dr. H. M. Cook examined over five hundred boys in a Minneapolis private school and there were ten undescended testicles and seven of these descended spontaneously. Dr. Wilder has mentioned that there may be some confusion due to the fact that an examiner may believe that the testicle is not present in the scrotum when it is merely drawn up in the inguinal canal or close to the ring by contraction of the cremaster muscle. Dr. Drake described his method of examining and I assume that the observations were accurate. Therefore, it seems to me that it is apparent that many of these testicles descend spontaneously; and if a par-

ticular kind of treatment is used, credit might be given to the treatment when the descent might occur naturally and without treatment.

Dr. Creevy has mentioned that someone has called attention to the fact that a hypertrophy of the external genitals occurs as a result of injections of anterior pituitary-like substance. I have observed this to be true and I believe that it causes a very definite hypertrophy of the testicle and external genitals; probably this increase in size in the testicle is an important part of the mechanism of bringing the testicle down, particularly when the testicle is surrounded by the tight envelope of canal structures with an opening below. As it increases in size it tends to squeeze itself out through the external ring.

DR. O. J. CAMPBELL: I am sure that a group of surgeons could spend an entire evening on this interesting subject without exhausting the topic. My impression of the reported results of endocrine administration is the same as Dr. White's, varying from skepticism to frank disbelief. While undoubtedly some favorable results have been obtained, I believe that the majority of highly favorable reports represent a not too critical attitude on the part of the writers.

Dr. Platou raises the question of how to deal with the undescended testicle from the standpoint of potential malignancy. My present attitude is that if operation is undertaken for unilateral undescended testicle and that if the testicle cannot be placed in the scrotum in a functioning position, I would remove it. I would not operate for the sole purpose of removing an undescended testicle, for I believe that the risk of malignant change is too small to be a major concern of the patient and is certainly small in comparison to the risk of developing cancer in other organs.

DR. C. D. CREEVY: There is another indication, if a rare one, for operation upon undescended testicle. This is in complete pseudohermaphroditism in which the sex of the individual can be determined only by exploration and biopsy. The question of whether to operate at once for undescended testes which do not descend in the first year of life, is not very important, because it does no harm to wait until puberty for spontaneous descent. If hormones then fail, operation should be done without delay or the germinal epithelium will atrophy.

The textbooks say that one must operate to straighten the penis in hypospadias whenever the patient is first seen, because the chordee becomes more difficult to correct with advancing years. This is not true, because the deformity can be corrected more easily in adult life than in infancy owing to the larger size of the penis. If the deformity is severe enough to prevent urination in the erect position, it should be corrected early to prevent the development of a psychological handicap.

DR. R. L. WILDER: In answer to Dr. Platou, I do not know upon what basis Dr. Campbell's statement is made. The significance of this or any report relating to the limits of time of descent or benefits of treatment, depends upon the kind of case considered under the term "cryptorchid".

The point of discussion, relating to precocious puberty as a result of treatment with gonadotropic hormone, has been the subject of a paper by Thompson in the January issue of the *Journal of Endocrinology*. He says that no case of significant precocious puberty developed in a child in less than nine weeks of treatment, while the benefit of descent of the testes usually takes place within this interval. This would shorten considerably the treatment period commonly recommended: four to six months.

I do not like to take away another good operation from the surgeon. However, it may be possible to determine the presence or absence of testicular tissue in hermaphroditism without recourse to abdominal exploration. Hess has found an absence of gonadotropic hormone in the urine of the normal male in the presence of normally functioning testicular tissue.

"Strangulated Hernia Reduced en Masse," the paper read by Dr. Willard D. White at this meeting, will be published in the July issue of THE JOURNAL-LANCET.

OBSTRUCTION OF THE SIGMOID COMPLICATING A FRACTURE OF THE PELVIS

HARVEY NELSON, M.D.

MINNEAPOLIS, MINNESOTA

Paper presented at Minneapolis Clinical Club meeting of December 9, 1937

Localized obstruction of the large bowel in the region of the sigmoid is a relatively common surgical condition in adults.

One of the most frequent causes for obstruction in this area is carcinoma. When we consider the fact that cancer of the recto-sigmoid area is more frequent than in any other part of the bowel, we can appreciate the reason for this incidence. The very frequent fact, too, that the tumor or the partial occlusion caused by the tumor causes no appreciable symptoms until there is suddenly an acute practically complete obstruction, prevents the removal of such tumors before obstructive symptoms appear. One of the early symptoms of cancer here is often, therefore, obstruction.

Other causes of obstruction that we see are such mechanical types as results from diverticulitis, from a volvulus, an intussusception associated with a tumor, cicatricial tissue secondary to ulceration, or constricting peritoneal bands.

It so happens that we had under treatment at about the same time, three quite similar but still quite different cases of obstruction of the sigmoid, which offered a rather interesting comparison. The first two of these were from neoplasms in the sigmoid, the one in an elderly individual and the other in a young patient; the third is a case that we wish to report.

The first patient is a female, aged 63, who first developed symptoms only a few weeks before the onset of her obstruction, of pain throughout her abdomen right after eating which gradually became more constant and cramp-like. She was unable to eat the last two days because of pain. She had a feeling of pressure in her chest which was relieved by belching. Her appetite was poor and she had lost weight. Her bowel movements, she felt, were normal until three weeks before and she had had no bowel movements for three days. On examination, the abdomen was found to be moderately distended and rigid and there were definite obstructive symptoms. Her pulse was 86, the blood pressure was 182/102. The temperature was normal. Arrangements were made for X-ray studies to be taken the following day. That night, however, she suddenly developed a complete obstruction and she was sent into the Northwestern Hospital where X-rays were taken. A barium enema was done which revealed a complete obstruction of the sigmoid. A cecostomy was done and 11 days later an annular carcinoma was removed. There has been no evidence of recurrence in three years. The first X-ray plate, which was a flat plate of the abdomen, shows a markedly distended colon with the distention extending distally to the sigmoidal area. The second X-ray plate, taken after the administration of a barium enema, shows the rectum and lower sigmoid to be filled with a complete obstruction of the upper portion of the sigmoid.

The second case is that of a female 29 years old. She gave a history of some constipation and occasional attacks of abdominal pain for 1½ years. At the time of the onset of her symptoms, she had not had a normal bowel movement for weeks. Her temperature and pulse were normal. She presented symptoms of an incomplete large bowel obstruction when first seen and was not greatly distended. On pelvic examination, a very large adherent cyst was found in the pelvis lying mostly on the left side. After admission to the hospital, she developed symptoms of a complete obstruction. Preliminary X-ray plates showed several areas of calcification within the pelvis and a diagnosis of a dermoid cyst with obstruction of the sigmoid probably due to adhesive bands was made. The barium enema showed an obstruction at the junction of the descending colon and sigmoid. At operation a very large adherent dermoid cyst was found and it still seemed logical that the obstruction was due to constricting adhesions about the cyst which was super-

imposed on and adherent to the sigmoid. However, on removing the cyst a small, obstructing annular type of carcinoma was found in the sigmoid. This patient is still living, but has recently developed a recurrence with metastasis. The interesting comparison in this particular case is, first, the fact that we had a case in which there seemed to be a logical explanation for a mechanical source of the obstruction on the basis of adhesive bands, but nevertheless a carcinoma was found; and secondly, the fact that the carcinoma in this particular case under the microscope appeared considerably more malignant than in the first case, although the symptoms were much the same and the lesions about the same size. The comparison inclines one to speculate as to the relative increased malignancy in younger individuals. The first X-ray, a preliminary plate, shows the areas of calcification in the dermoid cyst and some of the dilatation of the large bowel. The second X-ray, taken after the administration of a barium enema, shows the complete obstruction of the upper portion of the sigmoid.

Case No. 3 is that of a male 33 years old, who 1½ years before was in a truck accident in Fargo in which he sustained a markedly comminuted fracture of the left acetabulum with a posterior and upward dislocation of the femur. Fractures were found in the left pubis and there were also separations of the symphysis pubis and the left sacro-iliac joint. Union had already taken place when he came under our observation. About one year after the accident, he developed attacks of pain in the left lower quadrant of the abdomen with some difficulty with bowel movements. This discomfort gradually became more constant so that about 1½ years after the accident he reported for examination. At that time, there were no violent symptoms but he did show some degree of abdominal distention and what appeared to be an enlargement of or dilatation of the descending colon. A barium enema was administered under fluoroscopic control and it was found that there was a fairly marked obstruction of the colon in its sigmoid portion just below the crest of the left ilium. A rather marked narrowing and obstruction was noted at this point. A preliminary cecostomy was done which was followed later by an exploration of the obstructed area in the sigmoid. Both the small and large bowel in the left lower quadrant of the abdomen was found to be matted together to the extent that it was extremely difficult to identify the descending colon and sigmoid. When the sigmoid was isolated, it was found to be looped upon itself and firmly adherent to the lateral and posterior pelvic wall over an area of 3 to 4 inches. There was considerable induration and edema which made it exceedingly difficult to identify and separate the bowel from the parietal peritoneum. There was dense scar tissue formation throughout this area. When the sigmoid was freed an hour-glass type of constriction was found which made it resemble two adherent loops of bowel. There was considerable induration and the condition resembled very much a scirrhous annular type of carcinoma. A Mickuletz type of resection was done and about 6 or 8 inches of the sigmoid removed. Examination of the specimen after operation revealed almost a complete constriction of the sigmoid to the extent that it was possible at that time to insert only a small probe through the opening. The markedly constricted area was approximately one-half inch in length and from here tapered out to the normal diameter of the bowel an inch and a half or so from the central constricted area. Microscopic examination of the tissue showed no signs of any malignancy.

This case has been of particular interest to us, first, because of the manner in which the symptoms and operative findings resembled very closely those of an annular carcinoma of the sigmoid and secondly, because the type of obstruction that was found here was entirely different from the usual obstruction resulting from peritoneal or adhesive bands. Undoubtedly, an extensive hemorrhage occurred at the time of the fracture which completely involved the sigmoid and its attachment. The subsequent development of scar tissue surrounded and encircled the bowel gradually causing an annular type of constriction by scar tissue formation much in the same manner that a constriction occurs in an annular type of carcinoma.

L. R. BOIES,
Secretary.

News Items

Dr. Jennings C. Litzenberg, who has been Professor and Head of the department of obstetrics and gynecology in the University of Minnesota medical school since 1906, will retire July 1. Dr. John L. McKelvey, Head of the department of obstetrics, Peiping Union Medical College, has been appointed by the Board of Regents of the University of Minnesota to succeed him. Dr. Litzenberg will serve as Professor Emeritus of obstetrics and gynecology.

Dr. Ralph Rossen of St. Peter, Minnesota, has been appointed superintendent of the state hospital at Hastings to take the place of William J. Yanz who has resigned after thirty-eight years of service. The change will be effective June 30th. Dr. Rossen is at present assistant staff doctor at the St. Peter state hospital.

Dr. Harold W. Gregg of Butte, Montana, was elected president of the Medical Association of Montana at the annual meeting held in Livingston in April.

Dr. J. C. Shirley, Huron, was named president-elect of the South Dakota Medical association at the annual convention meeting held in Huron last month.

Dr. E. M. Porter of Great Falls, Montana, was elected president of the state board of health at the board's annual meeting held in Helena in April. Dr. Porter succeeds Dr. B. L. Pampel of Livingston. Dr. G. F. Turman of Missoula was elected vice-president, and Dr. W. F. Cogswell, who has been secretary more than 25 years, was renamed to his office.

Dr. Byron L. Pampel of Livingston, Montana, has been named superintendent of the state hospital at Warm Springs.

Dr. C. J. Glaspel, Grafton, president of the Grand Forks District Medical society, discussed the "Trend Toward State Medicine" at the society's meeting in April.

Dr. J. S. Reynolds of Minneapolis, Minnesota, was elected president of the Hennepin County Medical Society last month. He succeeds Dr. H. L. Ulrich.

Dr. H. E. Hilleboe, director of the Divisions of Tuberculosis and Services for Crippled Children of the Minnesota State Board of Control, presented a paper on "The Needs of the Crippled Child" at the National Conference on Services for Crippled Children at Washington, D. C., in April.

Five doctors were licensed to practice in Montana after passing the State Board of Medical Examiners' examination in April. Dr. S. A. Conney of Helena, secretary, announced. They are: Dr. J. G. Stubblebine of Big Timber, Dr. W. S. Wessell of Missoula, Dr. William R. McElee of Malta, Dr. A. J. Kreft of Fort Peck and Dr. James J. McCabe of Helena.

Dr. Samuel Miller of Ellendale was elected president of the Southern District Medical Society of North Dakota at the annual meeting of the association held in April. Dr. Roy Lynde, also of Ellendale, was elected secretary-treasurer.

A gift of \$10,000 has been received by the University of Minnesota Board of Regents for the inauguration of a serum center at the University. Mrs. John Dwan of Minneapolis, mother of Dr. Paul Dwan of the department of pediatrics, has donated this sum.

Dr. C. M. Keeling of Springfield, South Dakota, has completed fifty years of medical service in that community. A graduate of the University of Indiana school of medicine, class of 1887, Dr. Keeling came to Dakota Territory and started practice at Delmont that same year. In 1888 he bought out a practice at Springfield for the sum of eighty dollars and has remained there for the half century since that date.

The North Dakota Anti-Tuberculosis association announces that Camp Grassick will open its 11th season of service to low vitality children on June 11, 12 and 13. A special department for crippled children has been added this year.

Miss Irene Dillon of St. Paul has been appointed superintendent of St. John's hospital, Red Wing, Minnesota, to succeed Miss Hannah Keller, who has resigned after thirty-five years of service.

Physicians and surgeons who treated patients under the North Dakota Farmers Mutual Aid corporation program during March will be forced to take a 13 per cent reduction from the fee schedule, Margaret L. Rennie, assistant secretary, announced last month. Provision for pro-rating the corporation's funds is contained in an agreement with the North Dakota Medical association, approved December first.

Dr. Charles Houtz of Havre, Montana, left last month for Alaska, where he will spend a two months vacation. He will superintend the buying of equipment for the new hospital at the Methodist Episcopal Mission at Sand Point, Alaska, and plans on spending part of his time at the Squaw Harbor hospital assisting in local work.

Dr. E. M. Larson of Great Falls, Montana, was re-elected president of the Montana Tuberculosis association last month.

The North Dakota State Tuberculosis Sanatorium at San Haven has a new 125 bed infirmary unit; completed at a cost of \$300,000 the unit was built with the aid of an appropriation from the state legislature and a PWA grant. The Sanatorium celebrated a quarter century of service in September, 1937.

The annual spring clinic of the Yellowstone Valley Medical society was held in Billings, Montana, May 2, 3. The spring clinic was held in conjunction with a free diagnostic clinic to which all crippled children in the Billings area were invited.

The medical, dental and legal professions of Luverne, Minnesota, joined in a meeting in April to discuss their mutual problems. Associations represented were: the Southwestern Minnesota Medical society, the Southern Minnesota District Dental society and the Thirteenth Judicial District Bar association.

The new Moose Lake State Hospital for the insane will begin operations soon, C. R. Carlgren, chairman of the Minnesota state board of control has announced. Constructed at a cost of \$2,346,675, the hospital has accommodations for 1,000 patients. In addition to the medical buildings and treatment wards, it has 1,700 acres upon which food supplies will be raised, a power plant, sewage disposal system and water supply.

Dedication ceremonies for the new hospital at Bowbells, North Dakota, were held on May 12th.

Dr. Demeter Kalinoff, for 36 years a practicing physician and surgeon in Stillwater, was named to the Stillwater Hall of Fame last month, at the annual Hall of Fame Banquet. Dr. Kalinoff was honored by 125 of his fellow citizens for his "charity, generosity and kindness in his practice among the people of Stillwater."

A series of infant and pre-school conferences were held in Valley City, North Dakota, the first two weeks in May. The conferences were sponsored by the Child Welfare Division of the Community Club and were conducted in coöperation with the local Board of Health, the Division of Child Hygiene of the State Health Department, the County and City Advisory Committee and physicians and dentists.

The practice of the late Dr. Henry T. Norrgard of Milaca, Minnesota, has been purchased by Dr. Melvin L. Fredlund who formerly lived in Minneapolis. Dr. Fredlund was graduated from the University of Minnesota Medical School in 1936 and interned at Kansas City General Hospital, Kansas City, Mo.

Dr. William S. Elliott, formerly of Newark, Illinois, urology and skin disease specialist, has joined the Lenont-Peterson Clinic of Fargo, North Dakota.

Dr. J. C. Swanson and Dr. Harry J. Fortin of Fargo, North Dakota, conducted the first two of the series of crippled children's clinics in April. Dr. Swanson was in charge at Williston and Dr. Fortin at Dickinson.

Prevention of blindness was discussed at an open meeting of the Minnesota Council of Agencies for the Blind at Minneapolis, May 20. Dr. Charles E. Stanford, consulting ophthalmologist for the state division of the blind, state board of control, spoke on "Familial Blindness."

Dr. Robert R. Swanson of Helena, Montana, has moved to Albert Lea, Minnesota, to associate with Dr. F. G. Folken, eye, ear, nose and throat specialist. Dr. Swanson was graduated from the University of Minnesota medical school in 1926. At Western Reserve University in Cleveland, Ohio, he specialized for three years in diseases of the eye, ear, nose and throat.

Dr. F. E. Harrington, Minneapolis public health commissioner, was honored at a testimonial dinner May 23 on the anniversary of the opening of the Lymanhurst Health center which he established 17 years ago. Sent to Minneapolis in 1920 by the United States Public Health service, Dr. Harrington urged establishment of a school for tubercular children, and in 1921 Lymanhurst was built. Sponsors of the testimonial were members of the Minnesota Public Health Association.

Dr. Will H. Moore, Valley City health officer, was elected president of the North Dakota Health Officers' association, May 16. He succeeds Dr. G. U. Ivers, Fargo. Other officers chosen at sessions preceding the formal opening of the North Dakota State Medical Association meeting, were Dr. W. A. Wright, Williston, vice-president, and Dr. Maysil L. Williams, Bismarck, secretary-treasurer.

The Northern Minnesota Medical Association will hold its fall meeting at Crookston, Minnesota, on August 29th and 30th.

The Charles Mix and Union counties of South Dakota have received awards of merit in the fourth annual rural health contest, Dr. P. B. Jenkins, state health department supervisor, has announced. The contest was sponsored by the U. S. chamber of commerce and the American Public Health association. Factors considered in making the awards were: the extent the water supplies of communities are protected, advancement in sanitation, safety of milk supply, care of pre-natal cases, medical supervision of infants, availability of nursing services and activities toward control of tuberculosis and syphilis.

Dr. D. D. Leeper of Eaton, Colorado, has moved to Laurel, Montana. Before going to Eaton, where he resided only a short time, Dr. Leeper had practiced at Holbrook, Nebraska, for many years. He is a graduate of the Chicago University School of Medicine.

The Flandreau municipal hospital at Flandreau, South Dakota, has had a successful year according to the annual report. The hospital was opened one year ago.

Dr. G. A. Sarchet of Mobridge, South Dakota, has been appointed district surgeon at the Milwaukee hospital.

A diagnostic clinic for the physically-handicapped children of Custer and surrounding counties was held at Miles City, Montana, in April. Entire cost of the clinic was carried by the Division of Crippled Children of the State Department of Public Welfare.

Dr. H. C. Peabody, for many years eye, ear, nose and throat specialist with the Peabody clinic at Webster, South Dakota, has moved to Sisseton where he has opened an office.

The State Hospital for the Insane at Warm Springs, Montana, set a new record for number of inmates at the institution during March when 1,905 persons were listed.

Dr. Maude M. Gerdes, Minneapolis, specialist in obstetrics, has received an appointment to the children's bureau of the United States department of labor. Dr. Gerdes, whose home is in Eureka, South Dakota, was graduated from the University of Minnesota medical school in 1930.

An iron lung, respirator for treating paralytic victims, is now being maintained in Fargo, North Dakota, by the Gilbert C. Grafton American Legion post there. The respirator is available to any one needing it in North Dakota and neighboring communities.

Dr. A. W. Pasek has moved to Cloquet, Minnesota. For the past year he had been practicing in Lismore. Dr. Pasek was graduated from the University of Minnesota in 1935.

ERRATUM

In the May issue of JOURNAL-LANCET, in the article "Prostatitis" by Dr. Roger G. Hassett, the first word on page 248 should read "atypical" instead of "typical".

Necrology

Dr. Amos A. Flaten, 73, of Edinburg, South Dakota, died on April 22. A graduate of the old Minneapolis College of Physicians & Surgeons in 1890, Dr. Flaten had spent all his 40 years in medicine in Edinburg except for a brief period in Park River. He had not practiced the last seven years. Two years ago he suffered a paralytic stroke and had been ill since then. Dr. Flaten was born in Black Earth, Wisconsin, September 30, 1864.

Dr. J. R. Critchfield, 48, of Fargo, North Dakota, died at the Veterans hospital at St. Cloud, Minnesota, on May 3, 1938. A graduate of the University of Minnesota medical school in 1922, Dr. Critchfield was the son of a pioneer physician, the late Dr. L. R. Critchfield, who came to North Dakota in the early 1880's.

Dr. Charles M. Storch, 68, who had practiced in Grand Rapids, Minnesota, for many years, died recently in Biloxi, Mississippi where he was making his home. He was a graduate of the University of Michigan, class of 1891.

Dr. William Dinwoodie, 84, a resident of St. Paul for 55 years, died May 12, 1938, at the Minnesota Masonic home at Savage, Minnesota. Dr. Dinwoodie was born in Manchester, England. Before coming to St. Paul, he practiced in New Bedford, Massachusetts, for five years.

Dr. O. H. Ternstrom, 47, of Minneapolis, Minnesota, died suddenly on April 20, 1938. Dr. Ternstrom had practiced in St. James, Minnesota, for many years before coming to Minneapolis.

Dr. C. S. Newman, 73, Princeton, Minnesota, died at his home May 14, 1938. Born in Germany, Dr. Newman had lived in Princeton for 50 years.

North Dakota State Board of Medical Examiners

DOCKET OF CASES

Attorney General Rules on Right of Osteopath to Use Internal Medicine

On February 25th, 1938, Alvin C. Strutz, Attorney General of North Dakota, rendered an opinion to Mr. Willson, executive director of the Public Welfare Board, that under the law of North Dakota, Osteopaths were not entitled to use internal medicine in their practice except the right to prescribe and use such medicinal agencies as shall be necessary in connection with the practice of obstetrics, namely, anesthetics and pituitous.

Osteopath Pleads Guilty to Violation of Medical Practice Act

Herman L. Zarch, a practicing osteopath, at Lidgerwood, N. D., was arrested upon a charge of violating the Medical Practice Act though advertising himself as a qualified physician and using internal medicine in his practice. On April 18th, 1938, at Wahpeton, N. D., before Judge Hutchinson, in the District Court, he pleaded guilty and was sentenced by the Court to pay a fine of \$50.00 and costs, with the fine suspended upon condition that he observe his agreement to cease using internal medicine excepting in cases of obstetrics and to cease to hold himself out as engaged in the general practice of medicine, and from holding himself out as a doctor, physician, or surgeon excepting as a doctor of osteopathy or as an osteopathic physician.

Minnesota State Board of Medical Examiners

Julian F. DuBois, M.D., Secretary
St. Paul, Minnesota

DOCKET OF CASES

St. Paul Osteopath Removes Designation of "Aurist"

Re: SAMUEL M. STERN, D.O.

Following a complaint made to the Minnesota State Board of Medical Examiners that one Samuel M. Stern, a licensed osteopath with offices at 512 Hamm Building, St. Paul, was using the designation of "Aurist" on his door and stationery, an investigation was made of the matter by the Medical Board. A careful study of the osteopathic law of this state and other authorities, convinced the Board that an osteopath is not entitled to use that designation in Minnesota. The Minnesota osteopathic law specifically provides: "The practice of osteopathy is hereby declared distinct from that of medicine or surgery . . ." The Minnesota law also provides that an osteopath cannot furnish medicine for internal use, nor can he do major surgery. The accepted meaning of aurist undoubtedly is a physician who specializes in the treatment of diseases of the ear without any limitation as to the scope of the treatment. It seems logically to follow that the term osteopathy by the very nature of its statutory limitations, cannot, and does not harmonize with the accepted version of the term aurist.

The Minnesota State Board of Medical Examiners so notified Stern and after consulting with his lawyers, Stern removed the designation.



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Fifty-Seventh Annual Session
Huron, South Dakota
May 9, 10, 11, 1938

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AT THE UNIVERSITY OF SOUTH DAKOTA

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C. E. SHERWOOD, M.D., <i>Secretary</i>	Madison

ANNUAL MEETING OF THE COUNCIL OF THE SOUTH DAKOTA STATE MEDICAL ASSOCIATION

Monday, May 9, 1938, 4:00 P. M.

Marvin Hughitt Hotel—Huron, South Dakota

First Meeting of the Council

The Council was called to order by Dr. S. M. Hohf, chairman, at 4:00 p. m., at the Marvin Hughitt Hotel.

Roll Call: the following were present: Drs. J. R. Westaby, J. D. Whiteside, C. E. Sherwood, B. M. Hart, J. C. Shirley, O. J. Mabee, S. M. Hohf, D. S. Baughman, W. E. Donahoe, H. R. Fleege, J. F. D. Cook, B. A. Dyar. *A quorum present.*

In the absence of Dr. M. J. Hammond, who was ill, on written request from second district, motion by Dr. Cook and seconded by Dr. Pittenger that Dr. G. A. Richards be appointed to act as Councilor from the Watertown District. *Motion carried.*

Secretary presented for approval the minutes of the 1937 annual session as printed in the September issue of THE JOURNAL LANCET, 1937. Also the minutes of a Council meeting held November 3, 1937, in Huron.

Minutes of Meeting of Council

Huron, South Dakota, November 3, 1937

The meeting of the Council of the State Medical Association was called to order by the President, Dr. E. A. Pittenger, following a luncheon at the Marvin Hughitt Hotel in Huron, on November 3, 1937, at 12:30 p. m.

Members present were: Drs. J. F. D. Cook, J. C. Shirley, C. E. Sherwood, S. M. Hohf, William Duncan, H. R. Kenaston, J. D. Whiteside, M. J. Hammond, B. M. Hart, Will E. Donahoe, and D. S. Baughman. Also present were Dr. R. C. Williams, Medical Director of the Farm Security Administration, Washington; Dr. N. K. Hopkins, former President of the Inter-Allied Professional Association, and Dr. B. A. Dyar, Executive Secretary of the State Medical Association.

The first order of business was the election of a chairman of the Council for the coming year. Dr. Whiteside nominated Dr. S. M. Hohf. Dr. Kenaston was also renominated for election. Vote was taken and Dr. Hohf was elected.

Dr. Williams explained the medical relief program as just approved by North Dakota and proposed a plan for South Dakota. Dr. Dyar was called upon to state what had already been done in South Dakota since May 1st when this medical relief program for standard loan clients of the Farm Security Administration went into effect. There was a general discussion held as to the best means of providing medical care for all clients of the Farm Security Administration in South Dakota.

Dr. Sherwood moved that: it is the sense of this Council that in the emergency medical care of clients of the Farm Security Administration we accept the principle of pro-rating the cost between physicians, dentists, hospitals and druggists and other expenses according to the average expense of the South Dakota Farmers Aid Corporation in this State. *Motion seconded and passed.*

As a second matter of business, Dr. Sherwood presented a bill of \$145.00 from the delegate to the American Medical Association, Dr. J. R. Westaby. It was moved and seconded that this bill be allowed and the warrant be drawn on the treasury for same. *Motion passed.*

A letter was read from the Eleventh District Medical Society asking for permission to disband and hand in its charter to the state association. Dr. Sherwood moved that the Eleventh District Medical Society be allowed to dissolve. Motion seconded by Dr. Cook and passed.

A letter from THE JOURNAL-LANCET, calling attention to the fact that articles from THE JOURNAL-LANCET had been abstracted in the *Journal* of the American Medical Association, was read.

The date for the annual meeting of the State Medical Association was discussed. Dr. Hart moved that the meeting be held on May 9, 10, 11. Dr. Whiteside seconded this motion. *Motion passed.* The site for the meeting was formerly chosen at Huron.

Dr. Cook moved that the Secretary authorize the American Medical Association to drop from membership those who have not paid up memberships to the State Association. Motion seconded by Dr. Hart and passed.

The matter of allowing Dr. R. A. Butler to become an honorary member was discussed. No action was taken.

Dr. Pittenger moved that the Secretary be empowered to prepare resolutions to the American Medical Association concerning pending legislation leading toward state medicine. Motion seconded by Dr. Whiteside and passed.

Meeting adjourned.

CLARENCE E. SHERWOOD, M.D.,
Secretary.

Minutes were approved.

The report of the Committee on Arrangements was given by Dr. Shirley. Dr. Shirley reported that all arrangements had been completed.

The report of the Secretary-Treasurer was given by Dr. Sherwood. It was moved by Dr. Cook and seconded by Dr. Baughman that the Secretary's report be accepted and referred to the Auditing committee. *Motion carried.*

Report of Secretary-Treasurer
May 7, 1938

May 2, 1937, Balance on Hand	\$1,063.54
Receipts—	
Back dues received for 1937	452.15
Rapid City Exhibit profits	123.11
Refund Alex Johnson Hotel	2.00
1938 dues at \$10.00—261 members	2,610.00
	\$4,250.80
Disbursements—	
Alex Johnson Hotel Guests	\$ 137.12
Expenses Railroad for Speakers	97.86
Bank exchange and float charges	2.91
Moving Expenses office to Madison	16.00
Printing and Supplies	57.53
Salary Executive Secretary	600.00
Salary Secretary-Treasurer	600.00
Expenses Secretary-Treasurer, Travel	22.41
Telephone toll	10.78
Express	2.55
Badges State Meeting 1938	19.61
Programs State Meeting 1938	56.35
Postage	38.47
Bond Secretary-Treasurer	5.00
Flowers	7.21
JOURNAL-LANCET Subscriptions	450.75
Council Dinner	12.36
Refund Pierre Dist. overpaid	2.00
Delegate A.M.A. Expenses	145.00
	\$2,273.91
May 7, 1938, Balance, Cash on Hand	\$1,976.89
Trust Certificate Langford State Bank No. 375	735.92

Membership by Districts

Aberdeen District Number 1	30
Watertown District Number 2	23
Madison District Number 3	23
Pierre District Number 4	18
Huron District Number 5	12
Mitchell District Number 6	23
Sioux Falls District Number 7	47
Yankton District Number 8	37
Black Hills District Number 9	37
Rosebud District Number 10	6
Whetstone Valley District Number 12	12
Members	268
Honorary	7
Total	261

Total number of doctors in state	468
Number of doctors deceased during year	11

Motion by Dr. Westaby and seconded by Dr. Cook that the report Dr. Dyar presented be referred to the House of Delegates for further action and consideration. *Motion carried.*

There was no old business.

Under new business Dr. Sherwood read a note of appreciation from Mrs. H. R. Kenaston and family for flowers, etc., in her recent bereavement. A petition was read by Dr. Sherwood from eleven physicians in the Mobridge territory requesting that a Northwest District Medical Society be established. It was moved by Dr. Cook and seconded by Dr. Hart that this petition for the formation of an additional district medical society be granted and be known as District Number 11. *Motion carried.* Referred to House of Delegates for action.

Dr. Hohf appointed the following auditing committee: Drs. Cook, Mabee, and Whiteside.

Motion by Dr. Stewart and seconded by Dr. Hart to convey through Dr. Richards the Council's sympathy in the illness of Dr. Hammond and their hope for his speedy recovery. *Motion carried.*

Meeting adjourned.

CLARENCE E. SHERWOOD, M.D.,
Secretary-Treasurer.

Second Meeting of the Council
May 11, 1938

Chairman S. M. Hohf, M.D., presiding. Roll Call; Drs. E. A. Pittenger, J. F. D. Cook, J. C. Shirley, C. E. Sherwood, J. R. Westaby, J. D. Whiteside, W. G. Magee, D. S. Baughman, B. M. Hart, G. E. Burman, W. E. Donahoe, S. M. Hohf, R. B. Fleeger, and J. L. Stewart. *Quorum present.*

Minutes of the first meeting were read and approved with the following correction: Moved by Dr. Pittenger and seconded by Dr. Hart that the report of Dr. Dyar be deleted from THE JOURNAL-LANCET account of our meeting. *Motion carried.*

Election of Chairman. Dr. Hart nominated Dr. Hohf for reelection. Nomination seconded by Dr. Mabee and passed.

Old business. The Auditing Committee report was given. It was moved and seconded that the books as audited of the secretary-treasurer be approved. *Motion carried.*

New business. Dr. Pittenger moved that Dr. Dyar be retained as Executive Secretary for another year or until such time as the Inter-Allied Council may employ a full-time secretary.

Mr. Cohen of THE JOURNAL-LANCET appeared before the Council and asked for a five-year agreement. He suggested that the Association continue the present agreement at \$1.50 for the next year; the year after that perhaps raise the fee to \$1.75 and thereafter negotiate for price. Dr. Pittenger moved that the association accept the five-year contract with this company, pay them \$1.50 next year and at the annual meeting next year decide what to pay them the following year. Motion seconded by Dr. Shirley and passed.

A resolution was read by Dr. Donahoe from the Seventh District Society regarding publicity concerning the election and state matters.

Dr. Riggs stated that after the proposed bill regarding registration has been finally completed, a copy should be sent to all

doctors. Matters pertaining to these proposed bills to be submitted to the legislature were discussed. Dr. Cook read the Basic Science Bill. This was discussed. Dr. Hart moved that the Council adjourn until 10:00 a. m. to meet with the officers and committees to discuss this legislative program. Motion seconded by Dr. Whiteside and passed.

CLARENCE E. SHERWOOD, M.D.,
Secretary-Treasurer.

Third Meeting of the Council May 11, 1938

Because the legislative material was not completed at 10 o'clock, the Council agreed to meet at 2:00 instead.

The meeting was called to order at 2 p. m. Roll Call; Drs. Sherwood, Whiteside, Shirley, Baughman, Hart, Burman, Lloyd, Donahoe, Hohf, Duncan, Pittenger, Westaby, Mabee and Dyar.

Dr. Hohf, presiding, stated that the object of this meeting was to discuss the Basic Science Bill. The members of the committee had gone over the matter very hastily and recommended that the bill, as presented at the morning session, was not satisfactory. They had considered the bill of Minnesota and Nebraska briefly and recommended that the council decide along which lines our bill should be drawn. There was considerable discussion but no definite conclusions were arrived at.

Dr. Baughman moved that Dr. Dyar be instructed by the Council of the State Medical Association to instruct the doctors of the state that after July 1st payment for bills for F.A.C. work will only be made to doctors who are members of the State Medical Association. The motion was seconded by Dr. Westaby and after a discussion was passed.

The Basic Science Bill was again discussed. Motion by Dr. Pittenger that: a committee be appointed to consider this bill; such a committee to be composed of the chairman of the Council and three members to be appointed by the chair; this committee to be authorized to rewrite the bill, to secure what legal advice is necessary and be allowed to pay for same; bill, after preparation, to be sent to each member of the Council for consideration and they asked to vote whether or not they approve the bill as sent to them. Seconded by Dr. Westaby. *Motion carried.*

Dr. Hohf appointed the following committee: Dr. Riggs, Chairman; Dr. Pittenger; Dr. Dyar; and Dr. Hohf, ex-officio member.

Meeting adjourned.

CLARENCE E. SHERWOOD, M.D.,
Secretary-Treasurer.

HOUSE OF DELEGATES, SOUTH DAKOTA STATE MEDICAL ASSOCIATION First Meeting

Huron, South Dakota, May 9, 1938

President E. A. Pittenger, M.D., presiding. C. E. Sherwood, M.D., Secretary. Meeting called to order at 7:30 p. m., Monday, May 9, 1938, in the Elks Ballroom of the Marvin Hughitt Hotel. Roll Call: Drs. E. A. Pittenger, J. F. D. Cook, C. E. Sherwood, J. D. Whiteside, B. C. Murdy, John Calene, Geo. Richards, A. E. Johnson, D. S. Baughman, J. R. Westaby, B. M. Hart, T. F. Riggs, Wm. Griffith, O. J. Mabee, E. W. Jones, B. A. Bobb, W. E. Donahoe, Goldie Zimmerman, J. B. Gregg, S. M. Hohf, E. T. Lietzke, E. O. Conner, R. B. Fleeger, R. E. Jernstrom, Wm. Duncan, R. Pfister. *Quorum present.*

Dr. Pittenger appointed the following reference committees: Reports of Officers—Drs. Duncan, Mabee and Jernstrom. Resolutions and Memorials—Drs. Stewart, Hopkins and Baughman. Amendments to Constitution and By-Laws—Drs. Shirley, Gregg and Whiteside. Nominations and Place of Meeting for 1939—Drs. Calene, Johnson, Baughman, Riggs, Griffith, Jones, Donahoe, Lietzke, Fleeger, Walters and Pfister. Credentials—Drs. Zimmerman, Richards and Hart.

Secretary presented the minutes of the 1937 sessions as printed in the September, 1937, issue of THE JOURNAL-LANCET. *Minutes approved.*

The report of the secretary-treasurer was read. It was moved by Dr. Westaby and seconded by Dr. Johnson that this report

go to the Committee of Officers for approval. *Motion carried.*

Dr. J. R. Westaby presented his report as Delegate to the A. M. A. Referred to reference committee. (See report.)

Reports of Standing and Special Committees were next given.

Committee on Scientific Work. Dr. Pittenger, representing the committee, said the program for this meeting was their report. (Referred to proper committee.)

Committee on Publications. Dr. Sherwood reported that THE JOURNAL-LANCET is the official publication for this Association. (Referred to proper committee.)

Committee on Medical Education and Hospitals. Dr. J. C. Ohlmacher presented a verbal report in which he stated that postgraduate education and courses for doctors in the state were very much in need. Dr. Ohlmacher proposed a plan whereby certain places in the state could be designated for these courses or medical centers established where the programs could be held. Doctors could pay "freight" as it is done in other states and the extension department and South Dakota State Medical School would cooperate heartily in this plan. Dr. Sherwood presented statistics regarding the total number of hospitals and related institutions in the state with total bed capacity and admissions.

Committee on Medical Defense. Report presented by Dr. Riggs who stated that no cases of malpractice suits had been brought up during the past year, but one case is coming up soon.

Committee on Medical Economics. Report read by Dr. Pittenger. (Referred to Reference Committee.)

Committee on Public Health. The report was presented by Dr. Baughman and referred to the proper committee.

Committee on Necrology. The report of deceased members was read by Dr. Vaughn and referred to proper committee.

Committee on Medical Licensure. No report.

Committee on Allied Group. To be presented later.

Committee on Radio Broadcasting. Dr. Hohf gave a report which was referred to the proper committee.

Committee on Public Policy. Dr. Pittenger presented the report of this committee. It was moved by Dr. Gregg that the medical licensure law regarding naturalization of citizens be retained. Motion seconded and carried. Dr. Baughman moved that the bill regarding designation of authority by which medical practitioners use the term "Doctor" be presented at the next session of the legislature. Motion seconded and carried. Dr. Riggs reported on the proposed bill for annual registration of doctors. A general discussion was held. Dr. Alway presented a report on the Basic Science Bill. (Referred to proper committee.)

Report of Council. Dr. Hohf read the minutes of the November 3rd meeting which were presented to the proper committee.

New Business—

The matter of dues was brought up by Dr. Sherwood. It was moved by Dr. Cook and seconded by Dr. Mabee that the dues for the coming year be \$10.00. It was necessary for this motion to lay on the table for one day.

The site for the 1939 A. M. A. meeting was discussed. Invitations were presented by Dr. Sherwood from various cities desiring the A. M. A. meeting. A general discussion was held. Dr. Cook moved that our delegate be instructed for the meeting to be held in Cleveland. Motion seconded by Dr. Westaby and passed.

Dr. Sherwood took up the matter of affiliate members. It was moved by Dr. Westaby and seconded by Dr. Hart that Section 5 of Chapter 1 of the By-Laws be so changed as to read as follows: *Affiliate member*—a member who has been a member for a continuous term of ten years who is not less than 65 years of age or incapacitated for work because of illness or infirmities and who is an honorary member of his component society, on request of his component society, may be an affiliate member by a majority vote of the House of Delegates of this Association. Affiliate members shall be privileged to participate in the Scientific Assembly of the Association; they shall not be required to pay membership dues and shall not receive the *Journal* of this Association except by personal subscription. Affiliate membership shall be conditioned on such

an affiliate member continuing the relationship with his component society herein defined.

Dr. Dyar reported on his duties as Assistant State Health Officer, Director of Medical Licensure, Medical Supervisor of the Farmers Aid Corporation, Secretary-Treasurer of the Inter-Allied Professional Assn. and Executive Secretary of the State Medical Association. A general discussion was held, especially regarding the continuation of the Farmers Aid Corporation medical relief program. This latter matter was referred to the Committee on Resolutions and Memorials.

Meeting adjourned until 10:00 p. m., May 10, 1938.

CLARENCE E. SHERWOOD, M.D.,

Secretary-Treasurer.

Second Meeting of the House of Delegates

May 10, 1938

President E. A. Pittenger, M.D., presiding. Meeting called to order at 10 p. m., May 10, 1938. Roll Call; Drs. E. A. Pittenger, J. F. D. Cook, J. C. Shirley, C. E. Sherwood, J. D. Whiteside, B. C. Murdy, John Calene, Geo. Richards, A. E. Johnson, D. S. Baughman, J. R. Westaby, B. M. Hart, T. F. Riggs, E. W. Jones, B. A. Bobb, O. J. Mabee, W. E. Donahoe, Goldie Zimmerman, N. J. Nessa, S. M. Hohf, E. T. Lietzke, E. O. Conner, R. B. Fleeger, R. E. Jernstrom, R. S. Howe, F. Pfister. *Quorum present.*

The minutes of the meeting of May 9th were read and approved.

The inaugural speech of the incoming president was given by Dr. Cook.

Dr. Ohlmacher proposed that, in view of the fact that so much had been gained in the past through the various members of this organization appearing before the legislature and through their contacts at home, some definite effort be made to support the medical school, not only for the coming year but in the future. It was his proposition that a committee be appointed, possibly to be called a Committee on the School of Medical Sciences, to be composed of members of this Association and the Inter-Allied Professional Association. This committee could make contacts with the various District Medical Societies, contact service clubs, P. T. A. organizations, Woman's Clubs, and sell the Medical School to them. They in turn could then contact their legislators.

Dr. Conner moved that a committee of three be appointed by the incoming president to work with the Allied Council to further the interests of the Medical School. Motion seconded by Dr. Murdy and carried.

REPORT OF COMMITTEE ON NOMINATIONS

Dr. Calene, chairman, gave the report of the Nominating Committee. The following were nominated: for President elect; Drs. J. C. Shirley; E. A. Pittenger. Vice-president 1939; Drs. O. J. Mabee; J. L. Stewart. Councilors: Aberdeen District No. 1—1939-41, Dr. J. D. Whiteside; Watertown District No. 2—1939-41, Dr. W. G. Magee; Pierre District No. 4—1939-41, Dr. B. M. Hart; Yankton District No. 8—1939-41, S. M. Hohf; Rosebud District No. 10—1939-40, Dr. S. J. Waters; Northwest District No. 11—1939-41, Dr. C. E. Lowe; Mitchell District No. 6—1939, Dr. J. H. Lloyd.

Place of meeting for 1939, Aberdeen, S. D.

Delegate to Annual Session of A. M. A., 1939-40, Dr. J. R. Westaby.

Alternate Delegate to A. M. A., 1939-40, Dr. C. E. Sherwood.

It was moved and seconded that this report be accepted. A supplementary motion was made by Dr. Jones that the Council accept the resignation of Dr. O. J. Mabee, as Councilor from the Sixth district and the name of Dr. Lloyd be nominated to fill the unexpired term of Dr. Mabee. Motion seconded by Dr. Bobb and passed. The previous motion was also carried. There being no further nominations, balloting was completed with the following results:

President-elect, Dr. J. C. Shirley.

Vice-president, Dr. O. J. Mabee.

Councilor Aberdeen District No. 1—1939-41, Dr. J. D. Whiteside.

Councilor Watertown District No. 2—1939-41, Dr. W. G. Magee.

Councilor Pierre District No. 4—1939-41, Dr. B. M. Hart.

Councilor Yankton District No. 8—1939-41, Dr. S. M. Hohf.

Councilor Rosebud District No. 10—1939-40, Dr. S. J. Walters.

Councilor Northwest District No. 11—1939-41, Dr. C. E. Lowe.

Councilor Mitchell District No. 6—1939, Dr. J. H. Lloyd.

Place of meeting, 1939, Aberdeen.

Delegate to Annual Session of A. M. A., 1939-40, Dr. J. R. Westaby.

Alternate Delegate to A. M. A., 1939-40, Dr. C. E. Sherwood.

REPORT OF REFERENCE COMMITTEE ON REPORTS OF OFFICERS

The report of the Reference Committee on Reports of Officers was next given. The report was found to be satisfactory except one item which Dr. Jernstrom desired to discuss. He felt that a more or less itemized account of disbursements be made so if we secure more money for political campaigning it would show what was done with the \$10 annual fee. An itemized expense account was read by Dr. Sherwood. Dr. Cook moved that this report be mimeographed and sent out to the respective secretary-treasurers of the district societies. *Motion seconded and carried.*

Dr. Calene moved and Dr. Lloyd seconded the motion to accept this report of the Reference Committee. *Motion carried.*

REPORT OF REFERENCE COMMITTEE ON RESOLUTIONS AND MEMORIALS

Dr. Baughman presented the following report of the Committee on Resolutions and Memorials, such committee composed of Drs. Stewart, Baughman and Hopkins.

The Committee endorses the reports of the Committees on Necrology and Public Health.

It also endorses the Report of the Committee on Medical Economics and recommends that the suggestions for providing the necessary financial aid to this Committee be carried out. The Committee approved the application of the Mobridge District No. 11, for a charter. The Committee also recommends that our State Medical Association pass a resolution similar to that passed in other states opposing the proposals of Senator J. H. Lewis for State Medicine. The Committee endorses the movement to secure a suitable basic science bill at the next session of the legislature. The Committee approves the action of the State Board of Health in regard to the licensing of foreign graduates and recommends that the provisions of the law requiring citizenship as a prerequisite for the taking of the examination for license to practice medicine in the state be maintained.

In regard to the appointments of oculists and plastic surgeons to take care of the work under the Department of Child Welfare and Crippled Children, the Committee recommends that the matter be left with the Academy of Ophthalmology of the State Medical Association to select the eye men and with the staff of the fully accredited hospitals of the state to select the plastic surgeons.

The Committee endorses the plan for a continuation of post-graduate extension courses through the state and recommends that these be carried on if possible along the lines suggested by the Executive Secretary of the State Medical Association.

The Committee approves the employment of a full-time Secretary for the Allied Council and recommends that the State Medical Association stand their share of the expense of said Secretary.

The Committee recommends the continuation of the understanding between the State Medical Association and the Farmer's Aid Corporation for the present and during the continuation of the emergency, and recommends the retaining of the present Board of Directors and the present Medical Supervisor. The Committee feels that Dr. Dyar has conducted this work in a very capable, efficient and fair manner and believes that it is to the best interests of all the physicians of the State to leave the matter in his hands to continue to do

the very best he can, as we feel he has done in the past. We also approve the stand that Dr. Dyar has taken in limiting the medical work of the Farmer's Aid Corporation, public health clinics, etc., to members of the regular medical profession.

Dr. Shirley moved and Dr. Riggs seconded a motion that this report be accepted. *Open for discussion.*

Dr. Dyar suggested that the eye men meet with the Director of the Division of Crippled Children so there would be more coöperation and more satisfaction concerning this work.

It was decided to leave the matter of salary expense of a full-time Executive Secretary of the Allied Professional Association to the Inter-Allied Council.

Dr. Jones suggested that letters be written to Congressmen asking for additional money to operate the F.A.C. program.

Dr. Shirley commended Dr. Dyar for his excellent work and stated that if we do not accept this medical relief plan, we will have something worse, speaking in defense of the effort that has been made to further the program. He also stated that the program would work out more satisfactory if all practitioners would live up to their contracts.

The medical relief program was discussed fully. Dr. Jones offered an amendment to this report stating that a resolution be read before the General Assembly on the following day both in the morning and afternoon in order to get it over to as many as possible memorializing each member to write to his Congressman asking him to give the South Dakota Farmer's Aid Corporation some aid in the way of more money to handle the number of applicants they have for it and that the Secretary after this meeting send out a letter to each individual doctor in the State regarding the same matter. Motion seconded by Dr. Mabey and carried.

Dr. Kraushaar amended the motion to accept the Committee report in regard to socialized medicine and especially the survey sent out to doctors by the A. M. A. Dr. Hart moved that this amendment be referred to the Medical Economics Committee for administration of the survey. Motion seconded and carried.

Motion passed to accept report of the Committee on Resolutions and Memorials.

Dr. Jones reported on the results of the election and moved that this election be unanimous for all candidates. Motion seconded and carried.

REPORT OF COMMITTEE ON AMENDMENTS AND BY-LAWS

Dr. Shirley presented the report of the Committee on Amendments and By-Laws and read a resolution regarding affiliate members:

"Be it hereby resolved, that Section 5 of Chapter 1 of the By-Laws be so changed as to read as follows:

"*Affiliate Member* — a member who has been a member for a continuous term of ten years who is not less than 65 years of age or incapacitated for work because of illness or infirmities and who is an honorary member of his component society, on request of his component society, may be an affiliate member by a majority vote of the House of Delegates of this Association. Affiliate members shall be privileged to participate in the Scientific Assembly of the Association; they shall not be required to pay membership dues and shall not receive the *Journal* of this Association except by personal subscription. Affiliate membership shall be conditioned on such an affiliate member continuing the relationship with his component society herein defined."

Dr. Shirley moved that this resolution be adopted. Seconded by Dr. Westaby and passed.

A recommendation was read from the Ladies' Auxiliary.

"As Chairman of the Advisory Committee to the Woman's Auxiliary, I wish to make the following report and comments.

"There has been a decided increase in the interest and activities of some of the District Auxiliaries, but a number of them have lacked the incentive or vision and have remained more or less dormant. In two or three of the Districts very decided and interesting projects have been undertaken and carried out very well. The lead taken by these Districts may be an incentive for others to follow. Through her efforts, Mrs.

J. R. Westaby, President of the Auxiliary, has been able to give the ladies an insight into medical problems and the important place that they may occupy by carrying on a program as outlined by the National Organization. Some of the projects that they have interested themselves in, include the subject of the control of cancer, the subscribing for and distribution of the magazine *Hygeia*, the aiding in the campaign for the control of syphilis and gonorrhea, beside the carrying on of educational matters relative to the profession and hospitals. In some instances, the Auxiliaries' activities have consisted largely of social gatherings which in itself is commendable and worthwhile.

"It is my impression that support could be received from the Ladies' Auxiliary in problems that are facing the medical profession in this state. Among them I would mention: Medical Education for Hospitals, Public Health, and Legislation. In the latter field I believe that they could be of material assistance. It would be possible, through the activity in political matters in our different communities, to learn of the ladies who are particularly interested in legislative matters generally, and with some special effort, we could familiarize them with legislative medical problems, and in this render a very decided service to the medical profession of the state. This activity could be carried on in local communities and in certain instances during the session of our State Legislature; some of those who have qualified themselves might make excellent lobbyists.

"Respectfully submitted: Drs. J. C. Shirley, E. A. Pittenger, J. F. D. Cook and C. E. Sherwood."

It was moved and seconded that this report be adopted. *Motion carried.*

Old Business—

Dr. Conner moved that the dues for the coming year be \$10. Dr. Hart seconded the motion which was carried.

It was moved by Dr. Lloyd and seconded that Dr. McLaurin be elected an honorary member. *Motion carried.*

Dr. Hohf moved that the secretary present bills to come up before the next legislature to all District Secretaries so that each District might be informed about our program and thus contact their local legislators. Motion seconded and passed.

Dr. Riggs suggested that the Society select a doctor to go to Pierre as a paid lobbyist from the beginning to the end of the session of the legislature, to see if we cannot get through our legislation. The matter of fees for the legislative program was thoroughly discussed. Dr. Jones moved that the society set their goal to start with at \$5,000 and that it be a ratio subscription; that each component district raise its quota within the next 30 days; quotas to be decided according to the number of men in the district and according to the conditions existing in that district. Motion seconded and passed.

Meeting adjourned. (1:10 a. m.)

CLARENCE E. SHERWOOD, M.D.,
Secretary-Treasurer.

COMMITTEE ON NECROLOGY

Mr. President and Delegates of the South Dakota State Medical Association:

Your committee on necrology kindly present the following.

It is with sorrow we record the names of our co-workers whom the Grim Reaper has garnered since our last annual session.

Arthur LeRoy Jones, M.D., of Gregory, South Dakota, aged 42, passed away August 9, 1937. He was a graduate of the University of Iowa, class of 1922. He was born at Scaller, Iowa.

Major William S. Bently, M.D., of Sioux Falls, South Dakota, aged 66, died in August, 1937. He was a graduate of the Hahnemann Medical College and Hospital in 1893. Dr. Bently located at Gary when he first came to South Dakota and moved to Hot Springs after a few years. He was in the military service during the Spanish-American war; he was overseas during the World War. On his return, he located in Sioux Falls and resided there until his death.

John R. Thompson, M.D., of Northville, South Dakota, aged 78, died August 18, 1937.

Irvin Henry Schmidt, M.D., of Faulkton, South Dakota, aged 47, died October 29, 1937. He was graduated from St. Louis University in 1916.

Clarence M. Peterson, M.D., of Sisseton, South Dakota, aged 52, passed away October 29, 1937. He was graduated from Drake University in 1913.

Martin M. Christenson, M.D., of Watertown, South Dakota, aged 79, died November 26, 1937. A native of Horsens, Denmark, Dr. Christenson was graduated from the University of Kansas in 1898.

Hampton Ray Kenaston, M.D., of Bonesteel, South Dakota, aged 67, passed away November 28, 1937. A graduate of Grant University in 1899, Dr. Kenaston was the first physician to settle in the Rosebud country and the first coroner of Gregory county. He was in active practice from the time he settled in this country until he died. For twenty-one years, he served as a member of the Board of Health and Licensing Board. In addition to his duties as a pioneer physician, he found time to serve the civic interests of his community. He was mayor of Bonesteel at the time a municipal power plant and a water system were installed. He was president of the school board when a new modern school building was erected. During the World War, he was chairman of the Liberty Loan committee. He was both a York and Scottish Rite Mason.

Frank H. Stewart, M.D., of Kimball, South Dakota, aged 61, died December 2, 1937. He was graduated from the Sioux City Medical College in 1902.

Albert Edward Taplin, M.D., of Veblin, South Dakota, aged 70, died January 15, 1938.

Granvill H. Twining, M.D., of Mohridge, South Dakota, aged 62, died February 14, 1938. He was graduated from Rush Medical College in 1910.

REPORT OF COMMITTEE ON PUBLIC POLICY AND LEGISLATION

To the House of Delegates of the South Dakota State Medical Association:

Your committee on Public Policy and Legislation wish to present the following for your consideration. *First*, that it is more important now, than ever before, that we become interested in politics. It would be fine if we could have several members of our profession in either the House or the Senate. It is still possible for us to contact the candidates for the House and Senate in our respective communities and acquaint them with the bills we wish to present at the next session of the Legislature.

These bills will be considered by this body during this session. As soon as we have definitely decided on the type of bill we wish to present, mimeographed copies will be sent to all members of the profession so that we can explain these laws to the respective candidates. This is especially important in view of the fact that the cults have been sending out material to the members of the last session of the Legislature for the last three months. They have been doing all in their power to put us in an unfavorable position with the men who, in all probabilities, will be present at the next session. If we can take these bills and explain them to the candidates and show them that it will be for the best interests of the general public, we will be able to overcome considerable of this unfavorable propaganda.

The first bill which we wish to present is a Basic Science Bill which is being considered by a special committee and which will be reported upon at this meeting. There is no question that some form of Basic Science Bill must be passed at this session of the Legislature or we are going to be over-run by cults. The longer the consideration of this bill is put off, the harder it is going to be to pass it, as each year finds an increasing number of cults in our midst, who are willing to spend their time and money to defeat our program.

The second bill which will come up for our consideration is the Bill for the Annual Registration of Physicians. This is also being considered by a special committee which will be reported on at this meeting also. There are a number of good features to this bill, and I am sure it will be given careful consideration and some plan will be worked out to the satisfaction of all concerned.

The third bill which we are considering is the one which will require the individual using the term "doctor" to specify

on what authority the title is being used. This law has been passed by a few of the States and will come up for consideration at most of the State Legislatures at the next session. The officers of the American Medical Association are recommending that such a bill become a law as it will help in clearing up much of the misrepresentation which we have appearing in our local papers at the present time.

We find osteopaths and chiropractors going out to the smaller communities and advertising themselves in various ways as doctors of medicine and the unfortunate thing about it, is that the public is being deceived. This bill would require anyone using the term "Doctor" in any form of advertising to state after his name what type of doctor he is and on what authority he is using the term.

REPORT OF COMMITTEE ON BASIC SCIENCE

Herewith is a report of the committee on Basic Science. This may be regarded as tentative, subject to advice and suggestions from the group.

1. The medical profession of this state realize, or must realize, that a basic science law of some form must be passed at the next meeting of the legislature in January. Osteopaths and chiropractors are coming into South Dakota in too large numbers to be comfortable for the safety of the profession or the laity. It will not be long before they will demand and obtain the same privileges as the licensed medical doctor. They are already doing obstetrics, minor surgery and clamoring for major surgery and entrance to our hospitals. In other words, the gates of the state are open to the cults. These gates can be closed and closed only by some form of medical legislation as the Basic Science bill in particular. To illustrate: compare Minnesota, with a Basic Science bill and complete drastic regulation of the osteopaths and chiropractors, and California, without a law, where the medical doctor, osteopath and chiropractor are actually having joint meetings and clinics.

2. Time. This committee wishes to warn you that this law must be passed at the next meeting of the legislature. The longer this is postponed the more difficult it will be to combat the rapid growing strength of the opposition.

3. How can this bill be passed? After study and consideration of our previous failures in passing medical legislation in this state, and after seeking advice from members of other states that have successfully passed such a bill, this committee wishes to make the following suggestions:

(a) The medical profession of this state must become vitally interested in politics from now until after the November election. We must elect representatives to the next assembly that we positively know will support the medical profession in any legislation. This committee believes that this can be done in no other way than to cinch the various candidates before election, rather than to attempt to influence a contrary one after election and during the session of the legislature. Party lines should not be considered, and whether Democrat, Republican, or what not—if his attitude toward our profession is satisfactory, after and only after a thorough investigation and contacts, he should receive our support. This can be accomplished by active, thorough work in every county. In other words, each candidate for the house or senate should be contacted and his definite reaction obtained and put on record as to things pertinent to medical legislation.

(b) To accomplish the above, we feel that machinery and organization must be set up at once along the following lines. The officers and counsel of the state association could be regarded as headquarters in coöperation with the basic science committee. The secretary would be in contact between headquarters and the field units, which are the district societies. These are the important units. Each district society should be responsible for every representative from his part of the state. In large districts it will be necessary to have committees in every county. They can report how things are going. It might be wise for the societies to discontinue scientific programs until after the assembly and have more frequent political meetings. For instance, have the likely candidates in for meet-

ings and discuss our objective and hear him tell in turn his reaction. In other words, put the heat on along a big front all the time.

(c) We recommend coöperation with the allied council. For instance, have the dentists, druggists, nurses, veterinarians, etc., in on our meetings. It seems to me, gentlemen, that it would be a very stupid politician who is not impressed by representatives of these important branches of American life united together towards a common goal.

4. Finances. To accomplish these ends, you can readily see we must raise funds. We will have to have active lobbying at Pierre to see we are not let down. I do not think we should rely entirely on a dependable lobbyist alone, but should have a medical representative of experience, broad acquaintance and political tact not only to work with our professional lobbyist but also to check him. The former must be paid and I think it would be worth our while to pay the medical lobbyist a good fee in order to get a good man and remunerate him for his loss of practice. There are several ways of raising this money:

(a) Through the state secretary.

(b) Through the district societies.

Personally, I favor the latter, because you can contact the men first-hand and not by mail. Raising funds by mail never seems satisfactory. No set fee should be made. Some men can not or will not give anything—or little. Some can, should and will give fairly sized sums. Again we suggest a committee be appointed in each district to raise funds as soon as possible. These can be forwarded to the state secretary or basic science committee, depending on the wishes of the council.

To summarize briefly: (1) each member of the profession must become a politician. The district societies should set up county committees responsible to them as to how the candidates stand. Medical meetings with the likely candidates should be held; these not just preceding election, but also during the summer and fall. (2) Funds must be raised.

5. The Bill. I do not think it is necessary to discuss the bill at this time. Suffice it to say that in my contacts with the A. M. A. in Chicago, that they advised a simple bill. It includes everything we desire and yet does not offer the loopholes and obstacles for the opposition of a more complicated one.

In conclusion, let us remember that if three or four hundred doctors, many of them prominent, outstanding figures in their communities, can not defeat a much smaller group of the culprits, there is something rotten in Denmark, and the rot lies in us.

REPORT OF COMMITTEE ON MEDICAL ECONOMICS

To the House of Delegates of the South Dakota State Medical Association:

If the Economics Committee of this association is to function as it should, some new plan must be made for its operation. There are many activities which should be actively controlled by this committee, if we are to keep pace with what is being done in our neighboring states. We can not do this unless we are given funds to pay for office help and the necessary expenses in handling the various activities of the committee.

We feel that every effort should be put forth to continue the good work that this committee has already started. The Allied Council which this committee aided in founding is one of the most important forward steps taken by the medical society in the last decade. Through it, we have been able to secure better coöperation with the various allied professions and we are expecting a great deal of help from this Council in promoting our legislative program.

The program of postgraduate education which this committee submitted two years ago, should be given greater consideration by the profession. In the two instances where the program was tried out, it was very successful, and if given proper consideration by the profession, I am sure would be of great value to us.

The secretary of the state association suggested another method of postgraduate study to the various district societies in the last few weeks. This plan was to have some recognized authority in one of the branches of the profession appear for one week

in various points throughout the state. That is, we would have a meeting every day for six consecutive days and in that way, bring the postgraduate course nearer to the home of the general practitioners. Whichever plan is followed, this committee feels that we should make a decided effort to study some form of postgraduate study in South Dakota and have the program under the control of the state medical society.

This committee also arranged to have a speaker's bureau in the various district societies throughout the state. We feel that this suggestion is a very good one and should be continued. By means of the speaker's bureau, the medical society would be able to send doctors out to the various clubs and social units throughout the state and educate the general public along medical lines. This would do a great deal to improve the relationship between the profession and the general public which we feel is very important to do whenever possible. In this connection, the committee feels that it was a mistake to discontinue the radio talks over Station WNAX at Yankton. This was a very important piece of work which was doing the profession an immense amount of good and we would like to have the Council consider reestablishing these radio broadcasts. We are going before the general public asking for rather an extensive legislative program and anything that we can do to improve our relationship with the general public should be done. We know of no one thing that would be so far-reaching as to continue the radio broadcasts. If each Councilor was made responsible for the material for these broadcasts, and given to understand that it was his responsibility, this committee feels that the material could be supplied.

In a number of neighboring states, the Economics Committee are sending out weekly stories of health and disease prevention in the newspapers, weeklies and dailies throughout the state. These stories are designed to supply rural and small city papers which can not afford to buy the syndicated health services, with authoritative information on health. In Minnesota, this newspaper service is sent to over 500 papers. In the state of Michigan, the Wayne County Medical Society is coöperating with one of the daily papers in putting out a medical supplement to the Sunday paper. In this supplement are discussed the various activities of the hospitals and the newer things in the practice of medicine. The profession in Wayne county states that this has been of great benefit to them and it certainly is a forward step which should be given consideration by our society.

The American Medical Association in accordance with resolutions adopted by the Board of Trustees is urging state and district societies to make a study of the prevailing need for medical and preventive medical services where such may be insufficient or unavailable. Many facts affect the demand and supply of medical services. In some communities, owing to conditions which may be peculiar to those areas, the demand for medical services may be much greater than in other communities having entirely different characteristics. Likewise there are in different communities variations in the number and nature of the services and facilities to meet the dissimilar and fluctuating medical needs. The study is intended to encourage state and county medical societies to inventory the medical needs or demands and the medical services or supply in their respective jurisdictions. Such a stock-taking, so to speak, would enable medical societies to determine whether there is a satisfactory balance in their communities. It is essential to know the nature and number of deficiencies which exist in those communities where medical services and facilities may be insufficient or unavailable. It is of no less importance to have a knowledge of those counties or area in which the demand for medical care is being satisfactorily met with existing services, agencies and facilities.

Regardless of whether the study in a county reveals an insufficiency or unavailability of medical and preventive medical services or shows sufficient and easily available services, a complete report should be made. With this in mind, they have asked the state and district medical societies to aid them in securing this information. A series of blanks will be sent out to the doctors, dentists, druggists, health departments and all other health and medical services arranged for the care of the sick.

We as a profession, are asked to assist in securing this information and forwarding it to the American Medical Association for its proper consideration. This committee recommends that we assure the American Medical Association that we will cooperate with them and suggest to the House of Delegates that the president and secretary of the Association handle it in whatever manner they deem expedient.

It must be apparent to you that if this committee is to function as it should and consider these various activities, some new arrangement will have to be made for it. Either adequate funds should be made available for the work of the committee, or some other plan be worked out which is satisfactory to the House of Delegates and fair to the individual members of the committee.

REPORT OF COMMITTEE ON SCIENTIFIC WORK

To the House of Delegates of the South Dakota State Medical Association:

Your Committee on Scientific Work presents the official program for this meeting as their report. We feel that this program is an excellent one. We have asked the clinicians to present material that is of interest to the general practitioner and to describe conditions that we find in our general practice.

We feel that this type of program is of greater value to the average practitioner, than would be discussions of very unusual cases.

The local committee has been of great value in arranging this program.

REPORT OF COMMITTEE ON BROADCASTING

To the House of Delegates:

The report of the Broadcasting Committee this year will be very brief.

One talk only has been put on the air since our last session at Rapid City, namely, that of Doctor R. G. Leland, whom you will remember with a great deal of pleasure as having given us a splendid talk at the public meeting, entitled "Confidence in Your Physician." It was broadcasted on August 9, 1937.

Your committee again urges that this valuable means of disseminating information, which the public needs, be again taken up and continued. Please be advised that the committee will be glad to carry on as it did during the eighteen months of a highly satisfactory period of broadcasting in 1935 and 1936. It is urged that the Association take up this matter with the object of reestablishing the broadcasting of informative papers by its membership.

Respectfully submitted,

S. M. HOFF, M.D., *Chairman.*

E. W. JONES, M.D.

E. L. PERKINS, M.D.

ANNUAL REPORT OF THE PUBLIC HEALTH COMMITTEE

The activities of your committee during the past year have consisted largely of cooperating with and trying to coordinate the various lay and professional groups engaged in public health work.

The American Association for the Control of Cancer is attempting through the Women's Field Army, acting under the supervision of your Public Health Committee, to conduct a state-wide educational campaign among our citizens in the hope that cancer patients will secure proper medical care earlier in the course of their disease. Mrs. Howard E. Trask, the state commander, has been active and the movement has undoubtedly begun to bear fruit. The public is becoming more and more cancer-minded and folks are consulting their family physician for any symptoms or lesions that might mean an early cancer, rather than waiting until it is too late to offer them any hope of cure. This educational movement has also served to emphasize the necessity for all physicians themselves being cancer-minded and keeping themselves up-to-date on the subject so that they are able to recognize and properly diagnose cancer in its earliest stages and advise the best treatment in each case. The movement also should have a very beneficial effect in stamping

out the nefarious practices of the cancer quack. This committee strongly recommends that every physician and physician's wife enlist in the army by paying their annual dues of one dollar and giving freely of their time and knowledge as the opportunity arises. The American Association for the Control of Cancer has furnished material for use in the campaign and I am happy to say that a number of clubs as well as auxiliary associations of the District Medical Societies have already availed themselves of this material for use on cancer programs.

We have also cooperated with the South Dakota Public Health Association in their campaign against tuberculosis. Some of the members of your Public Health Committee are also members of this association and have acted as advisors to the association. We have attended their meetings and have taken part in their discussions. We have recommended that the name of this organization be changed to the South Dakota Tuberculosis Association and we believe their efforts should be strictly confined to educational work, leaving the actual professional work such as Mantoux test, examination of pre-school and school children, teachers, etc., to the physician to handle. From our rather close contact with the South Dakota Public Health Association during the past year, we are convinced that the officers and members of this association are an earnest body who stand willing and anxious to cooperate to the fullest extent with the medical profession and that they in no way have any desire whatsoever to encroach upon the proper duties or rights of the medical profession. We recommend that the members of the South Dakota State Medical Association continue to cooperate in the excellent work that the South Dakota Public Health Association is doing. At this point your committee desires to congratulate Dr. Vincent Sherwood, Superintendent of the South Dakota State Tuberculosis Sanitarium, for his efforts in improving the efficiency of our institution and to urge all members of the medical profession to lend their whole-hearted cooperation and assist our officials in making our tuberculosis sanitarium of the greatest possible benefit to our people.

The matter of periodic health examination of food handlers has been given some attention and your committee, after some study and consideration of the subject, is of the opinion that such examinations as have been carried out in the past are practically worthless and that the expense is out of all proportion to any benefits that may be derived. The New York City Department of Health, after eighteen years of experience in compulsory examination of food handlers, discontinued the practice in 1934, after a thorough study of the problem, for the following six reasons:

"1. The examination of food handlers by private physicians cannot be accepted as reliable.

"2. The cost of physical examinations of food handlers made exclusively by the Department of Health is not commensurate with the public health benefits obtained.

"3. The most careful physical examination does not reveal the important conditions that may be transmitted by food handling.

"4. In order to be able to certify that a food handler is free from communicable disease, at least a chest X-ray, a Wassermann, and a stool examination for typhoid, paratyphoid, and amebic and bacillary dysentery carrier must be made. The cost of such an examination is almost prohibitive.

"5. Even if such a complete examination were made, there is no assurance that the food handler would remain free of communicable disease during the tenure of the certificate.

"6. Too much emphasis has been placed on the value of medical examinations as a means of preventing the spread of disease through food handling, especially as it relates to such communicable conditions as venereal diseases, tuberculosis and skin conditions."

Instead of compulsory examination of food handlers, the New York Health Department has adopted the following measures which can be carried out in any community, large or small, and which will be much more efficient in controlling the spread of infectious diseases and at the same time will not entail a great deal of expense.

"1. Prompt reporting of communicable diseases, giving the occupation of the individual. If a food handler is suffering

from a condition in communicable form, he can be immediately excluded from work and kept under supervision until it is safe for him to return. By this procedure, too, food handler contacts with certain communicable diseases may also be excluded from work.

"2. By thorough epidemiological investigation and follow-up of cases of typhoid fever, infected food handlers should be discovered. As of July 1, 1937, we had listed in New York City 727 typhoid carriers. Of this number, 397 were discovered as the result of epidemiological investigation; 270 were listed as the result of persistence of positive stools after recovery from typhoid; 35 as the result of food handler examinations; 23 as the result of operative procedures. It can be seen from this that the most important factor in detecting typhoid carriers is the epidemiological investigation. Of the 35 carriers found as the result of food handlers' examinations, 23 were found during the 11 year period of compulsory annual examination. Apparently, then, 18 food handler carriers discovered by epidemiological investigation had been missed by the routine examination of food handlers.

"In spite of the fact that food handler examinations were discontinued in New York City in September, 1934, there has been a constant diminution in typhoid fever as shown by the following table:

	1933	1934	1935	1936
Cases.....	557	332	314	305

"It would seem that food handler typhoid carriers in New York City have not been an important health menace during this period.

"3. Exclusion and strict supervision of food handler typhoid carriers and food handler members of their families.

"4. Education of food handlers—

(a) Instruction in personal hygiene. Clean hands are perhaps the most important yet simplest expedient to prevent food contamination. To this end, adequate washing facilities conveniently located with soap, running hot water, and clean towels must be provided in all food establishments.

(b) Instruction in handling food, namely the use of tongs, and forks, thereby minimizing the handling of food with bare hands.

(c) Placards of instruction to food handlers posted in wash rooms, and pamphlets of instruction distributed by food inspectors in the course of their routine duties.

"5. Lastly, to impress upon employer and employee alike that they are jointly responsible for violating the law if a food handler with a communicable disease is found employed.

"These, then, are the things we can and should do."

Your committee has also cooperated with the movement of the United States Public Health Service to control syphilis. While we believe that syphilis is not as prevalent in South Dakota as in many of our more congested districts, we also feel that it is just as important to discover the cases that do exist and see to it that they have proper treatment and that they are not allowed to spread the disease. We feel that the matter of periodic health examinations should be encouraged as much as possible and that, as a part of this examination, the Wassermann should be taken. We also feel that an educational campaign should be conducted in our schools and colleges and that the importance of a thorough medical examination, including the Wassermann test, before marriage should be taught our young folks.

The problem of the so-called Drugless Healing Practitioner should receive attention. As I see it, the concern of the regular medical profession and public health worker need not be on account of the theory and teaching of these cults; the danger arises from the fact that these practitioners do not confine their practice to their own systems. On the other hand, they represent themselves as doctors, fully qualified and prepared to practice not only chiropractic, osteopathy, optometry, etc., but also regular medicine and surgery. You and I know that these practitioners are not chiropractors, osteopaths, etc., because they believe that these methods of treatment are superior to regular medicine, but that they find this an easy way, because of the low standards and meager educational requirements, to secure a license to practice a healing art. Once they have

gained the title of "Doctor" they proceed to forget the drugless healing and start using and prescribing drugs, performing operations and trying in every way to practice regular medicine. I feel that every member of the medical profession should do everything he can to educate his patients and the public regarding this angle of the drugless healing problem. It is not necessary for any medical man to argue the point as to whether or not these so-called drugless methods of healing have merit, but I do believe it is important to educate our patients and the public in general, so that they may know that just because an individual calls himself "Doctor", it does not mean that he has been trained in the use of drugs or in the performance of operations. It is important for the people to know that the doctor who writes his prescription is a legally qualified Doctor of Medicine. I believe that if we insist that these practitioners confine their work to their own limited theory of practice, we are contributing a great deal to the general welfare of our citizens.

In the matter of maternal and child welfare and hygiene, we recommend the continued cooperation and encourage the use of the pre-natal letters and pre-natal care of pregnancy including a Wassermann test of the prospective mother as early as possible in her pregnancy. We also urge the post-natal care of both mother and baby periodically during the first year and recommend that the child be immunized against smallpox, diphtheria, scarlet fever, pertussis, and typhoid fever—all during the first year of life. The child should also be given a Mantoux test during its first year and every year thereafter this test should be repeated; in addition, a Shick test and a Dick test should be given annually. During the pre-school age these children should be examined at least semi-annually and special emphasis should be placed on development defects, the teeth, eyes, ears, nose, and throat. Before entering kindergarten, any needed corrective measures should be carried out and the child re-vaccinated against smallpox and if it has a positive Shick or Dick test, the appropriate immunization should be done.

On March 29, the executive committee of the State Medical Association met with the Madison District Medical Society and together with the members of the Ladies' Auxiliary, saw a pre-view of the moving picture entitled "The Birth of a Baby." All present felt that this picture has a worthwhile educational value and gave unanimous approval to the showing of the film to the general public. We desire to express our thanks to the Madison Theater Company, Madison, South Dakota, for the use of their State Theater which they so generously donated to us for the showing of this picture. The fundamental objectives of "The Birth of a Baby" as stated by the American Committee on maternal welfare are as follows:

"1. *To Reduce Maternal and Infant Mortality and Morbidity.* The United States has one of the highest maternal mortality rates in the civilized world. The lives of most of these mothers and babies could be saved if the public realized the necessity of medical attention from the very beginning of pregnancy. In the film we have attempted to epitomize maternal care and to show its importance in safeguarding mothers and babies from the hazards associated with maternity.

"2. *To Avert Fear of Child-bearing.* Intelligent women who have seen "The Birth of a Baby" have stated that they had always had the impression that the entire process of child-bearing, including the actual delivery, was far more complicated, painful and dangerous than the picture shows. This fearsome mental attitude on the part of many married women of child-bearing age is widespread, and may be dispelled by the simple outline of expectancy and labor as presented in this picture. Incidentally, this may have some effect in arresting our declining birth-rate.

3. *To Prevent Abortion.* Most abortions are intentional, and occur in homes where there are one or more children. All too frequently, the woman taking such a step does not realize that abortion is far more dangerous than actual childbirth. The screen presentation of the dangers of, and reasons against, abortion, is more graphic and convincing than any printed or spoken word, and the dramatic scene in the picture dealing with this subject can be expected to have a far-reaching effect.

"4. *To Warn Against the Dangers of Promiscuity.* Contemporary with the vigorous war on venereal disease, the film urges the necessity for universal pre-marital examination. This, supplemented with reexamination at the time of pregnancy, can do much to avert the ravages of syphilis and gonorrhea. By implication, each adult in the audience will realize how closely this touches his or her own life. No innocent daughter is likely to yield after she realizes the true significance of sex, and the enormous price she might have to pay for indiscretion—venereal infection or illegitimacy. The film is not designed to induce morality by fear, but frankly champions marriage and high ideals of sex as the state of normalcy and happiness for both sexes.

"5. *To Impress Fathers with Their Responsibilities.* Paternity implies a responsibility, not only to the child, but to the mother. But few fathers realize the processes of pregnancy, the strain on the woman's physical energies, or their own responsibilities in regard to child-bearing. The film, by example, shows what is expected of a husband in the way of love, consideration and kindness during this trying period.

"6. *To present Sex in its Proper Relation to Life.* The subject of sex has been made mystifying to the young mind by the strange ostrich-like attitude of the very persons to whom the child should look for guidance. To make matters worse, the screen is being employed to color the adolescent mind with intimate and erotic aspects of human relations, while no effort has been made to harness its vast influence for teaching the normal aspects of reproductive processes in their relation to life.

"Fortunately, there is now widespread recognition in high places that silence and fairy tales of the stork variety are not acceptable to the truth-seeking minds of the younger generation. This forward-looking attitude is exemplified in the following ways: The word *syphilis*, tabooed "in polite society" for years, is now at last appearing in the conservative *New York Times*, and is now permitted over the air by the National Broadcasting Company and the Federal Radio Commission, and the Surgeon-General of the United States Public Health Service now utilizes the screen as an efficient means of teaching the public what it should know about venereal disease.

"The committee believes that this picture will, through its straightforward approach to sex, result in a better understanding of its true significance, and in a closer relationship between mothers and daughters, and between fathers and sons.

"7. *To Entertain.* The committee would have preferred an entirely factual presentation,—but this would have defeated its own purpose, because masses of people are not attracted by lectures. Thus, this story of Life is dramatized around a young mother, her inexperienced husband, and their physician. There is entertainment without suggestiveness, and human interest without pedantry. It is a different type of entertainment than that presented by the many suggestive, salacious Hollywood pictures bristling with double meanings (yet approved by the censors), to which impressionable children are taken by their parents. Because "The Birth of a Baby" is not a dry lecture, we believe many will see it and be favorably influenced thereby.

"*The Exhibition of the Picture.*

"The picture can attain its objectives only if it is seen by the public. This might be accomplished in many ways,—the film could be shown (1) by medical groups to selected audiences, or to patients of individual physicians, (2) by public health agencies, as time and opportunity presented, (3) by hospitals, to clinic patients, (4) by mothers' clubs, parent-teacher associations, religious groups, etc., (5) by colleges, high schools or grade schools when there was sufficient initiative on the part of some teacher or group to arrange necessary facilities, (6) in motion picture houses by arrangements which would not interfere with the usual feature presentation, or (7) by motion picture theatres as a regular part of their program.

"The first six possibilities outlined above have some or all of the following definite practical drawbacks:

"(1) All such showings are bound to be sporadic.

"(2) Much time will be required to reach even a fraction of the population that needs the film.

"(3) Showings of such nature require halls or auditoriums, projection apparatus, publicity, organization, etc., and altogether

require considerable effort and expenditure by the group;—and often result in but mediocre projection of the picture.

"(4) Too much dependence would, of necessity, devolve upon the personal initiative of a few members of a group.

"(5) Groups which would see the picture would belong for the most part to the better educated classes,—or to the extremely poor (through free clinics), and a large proportion of the middle class would not be reached.

"(6) Many adolescents, not in high school or college, would never see the picture.

"(7) Many adolescents in grade schools or high schools, who would be benefited by seeing the picture, could not see it if showing was desired by the teachers, because of the possible opposition of a minority of parents.

"(8) Special morning showings at motion picture houses are likely to prove difficult and expensive, with limited attendance.

"For these and other pertinent reasons, we feel the film should be shown as part of a regular motion picture program. This would have many advantages:

"(1) The maximum number of people—millions—will see it in the minimum of time, and with the least of effort and expense. Only if the maximum number of people see it, can the film accomplish its purposes.

"(2) The film would thus be shown to mixed audiences as a normal picture of life, without segregating sexes and thus falsely labeling the picture as salacious, suggestive or indecent.

"(3) Advertisements related to the film can and will be controlled by this Committee, in order to maintain the high standard of the film.

"Without the facilities of the motion picture theatre, and its ability to reach and hold the attention of the theatre-going public, any educational effort of this nature must necessarily be circumscribed, and limited in effectiveness.

"Because of all this, we believe the film should be shown, and in the manner indicated."

THE AMERICAN COMMITTEE ON MATERNAL WELFARE, INC.

Signed F. L. ADAIR, M.D., *Chairman.*

We agree with the American Committee on Maternal Welfare that the public interest is best served by showing this picture in motion picture theatres.

Signed D. S. BAUGHMAN, M.D.,
Chairman.

REPORT OF DR. J. R. WESTABY

Delegate to the American Medical Association
Atlantic City Session, 1937

Mr. President, Members of the House of Delegates, and Councilors of the South Dakota State Medical Association.

It is my privilege at this time to bring you a short resume of the last annual session of the House of Delegates of the American Medical Association's meeting at Atlantic City June 7th to 11th, 1937.

On Saturday before the session the Accrediting Board of the Council on Medical Education and Hospitals met and after considerable discussion pro and con recommended that most of the two-year medical schools be discontinued. Special attention for some years has been directed to those schools giving only the first two years of the basic medical sciences. While improvement of these schools has shown commendable progress, the problem of transferring from a school of basic medical science to a clinical school for completion of a medical education, presents increasing difficulties and is a matter of serious concern to prospective medical students.

Dr. F. S. Crockett, chairman of the Committee on Medical Education, recommends that the premedical adviser in each college offering a premedical course, be urged to keep in close touch with the Council on medical education so that premedical students may be afforded better actual medical contacts.

Most of you know that the accrediting board is made up of medical educators well versed in the conditions existing in our medical schools and that they do not hesitate to make

drastic recommendations whenever they see fit to do so. Our own medical school was on the block and it was very doubtful if any of the two-year schools could survive the treatment the board was administering. Only a few two-year schools survived the knife and had it not been for the efficient work of our own president, Dr. E. A. Pittenger, who was sent single-handed to meet the board and who fought for every qualification of our course at Vermillion, it would have been dropped from the accredited list. Gentlemen, the physicians of South Dakota and the citizens of this state owe a vote of gratitude to Dr. Pittenger for his successful efforts in keeping the medical school in our university for at least another two years.

After calling the House of Delegates to order at 10:05 a. m. on June 7th, the speaker, Dr. N. B. Van Etten, spoke at quite some length on the responsibility of the delegates as they undertook the task of representing their state medical associations with over 100,000 members at home.

Our president, Dr. Charles Gordon Heyd, was then introduced and analyzed the social changes taking place in every phase of human endeavor. He spoke of the philosopher who might well exclaim, "Cursed be the social lies that warp us from the living truth." He might also listen to jangling nitwits, wishing to destroy the cultural and physical progress and development of the past 50 years by futile attempts to remodel human nature and incidentally remake the entire field of medical practice.

It had been the hope of Dr. Heyd that the medical profession be permitted to guide the progress of its own destiny. He pointed out a few of the noble things the profession had produced under the give-and-take plan of free competition in medical practice. Insulin, liver therapy, vitamin nutrition along with a host of other specifics has increased the effectiveness in improving the health of all of our people. The profession has developed orthopedic, cancer, and restorative surgery; has made diagnosis precise, by advances in X-ray and instrumentation, and has evolved effective therapy with X-ray and radium.

In brief, the medical profession has been so prolific in useful discoveries that medicine is to be rated well in advance of any of the physical sciences.

Dr. Heyd said the provocative question to be considered by organized medicine is the medico-social evolution now confronting us in which the question, "Has an individual a claim on the government for personal medical care?" must be answered. "It is not compulsory health insurance, or state medicine, that will destroy our present system of medical practice; it is an extension of institutional medicine for which the state will provide the funds."

In conclusion, President Heyd asked if the medical profession is prepared to accept the following propositions:

1. That every practitioner believes that the proved indigent is entitled to free medical service at public expense.
2. The principle that indigence is a local problem and should be handled locally where it arises.
3. The cost of indigent service should be on a capitation basis, (a tax on each head, as a poll tax, under the direction of the medical society).
4. Certification of the indigents, fairly, sincerely, honestly and sympathetically by a central bureau, one member of which shall be a member of the medical society.
5. The unequivocal opposition to all forms of compulsory health insurance. Insurance schemes tend to relieve the individual of his own responsibility and prolong his illness, making it profitable for him to be sick.
6. Solve the problem of immediate help for the emergency illness in the ordinary family with no surplus in the bank. This represents about 8 or 10 per cent of the acute illness at any one time.

All of these objectives could be attained by a mutual consideration of the problems between the various interested parties and organized medicine.

Finally, Dr. Heyd said: "There rests on the medical profession one obligation that is superlative to all others. We have received from the past the splendid edifice of modern medicine. It is our duty to hand that on to the generations yet to come, with that splendid spirit of science and the spirit of loyalty. The ranks of organized medicine must stand fast,

must speak unanimously with one resonant voice, so that medicine shall be left free to explore the unheralded realms of science and march forward with increasing effectiveness."

President-elect Dr. J. H. J. Upham was then introduced. He addressed the House of Delegates on the evolution of medical practice, tracing it through its various phases of development to our present complex system.

Under the reports of officers, the secretary, Dr. Olin West, stated that there were on April 1st, 105,460 fully paid-up members of the American Medical Association. This was a gain of nearly 5,000 over last year. Of this number, 66,296 were fellows of the association.

In South Dakota there were 562 physicians listed in the last edition of the A. M. A. Directory with 323 as members of the State Association and 190 as fellows of the A. M. A.

A resolution was forwarded to the secretary by Dr. B. R. Shirley, delegate from the section on laryngology. It read as follows:

"Whereas, the family physician has labored for these many years without full recognition of his valuable services, and

"Whereas, the various school systems of the United States depend on the family doctor for the prevention and diagnosis of disease and the protection of the public,

"Be it resolved, that the schoolboards and authorities in charge of the school systems all over our country be respectfully requested to enter and file on an index card for every school child, the name and address of the chosen family doctor; and be it further resolved, that the designated family doctor, together with the parents or guardians of the child, be informed of any emergency that may befall the child in the schools of this country."

Under the report of the bureau of legal medicine and legislation, item 13 is of interest to South Dakota physicians. The Resettlement Administration in connection with its relief activities has endeavored to aid its clients to obtain adequate medical and hospital care through the medium of loans made directly to such clients or indirectly through corporations organized by and on their behalf. In North and South Dakota because of the severe economic stress in the rural areas, so-called farmers' aid corporations were formed through which relief clients might obtain loans for medical services and hospital care. In all other states an endeavor was made to arrange with the county medical societies for medical service for its clients.

The bureau of economics prepared a synopsis of the existing state medical society pension or relief plans for indigent physicians and decided that from all present indications of actual need, it would be impracticable to organize a national "Benevolent Society" or a Relief Fund under the auspices of the American Medical Association.

The committee to study the problem of motor accidents, made an exhaustive study of the problem of traffic safety; and have given advice and support to every sound effort being made for safer roads, safer automobiles, drivers education, and better legal regulations and their enforcement. In some states provisions are made for the furnishing of evidence of physical and mental fitness of auto drivers before granting a drivers license. It is the purpose of the National Safety Council to make available to all states a model drivers' license code; so that individuals who are accident-prone may be examined for physical, mental, or psychologic abnormalities, and kept from multiplying the accidents on our highways.

A resolution on the investigation of the claims of Osteopathy and other sectarian methods of practice was presented.

"Whereas, the claims of Osteopathy and other sectarian methods of practice have never been thoroughly investigated and reported on by any qualified agency in the United States; and,

"Whereas, the persistent exploitation of such claims, including the claim of Osteopathy to be on a parity with the non-sectarian practice of medicine in every respect, reacts to the detriment of the public; and

"Whereas, a demand is being made now by the representatives of Osteopathy for recognition of Osteopathy by the United States Government, through the United States Employees Compensation Commission, as equivalent in every respect

to the non-sectarian practice of medicine so far as the treatment of disease and injuries among employees of the federal government is concerned,

"Be it resolved, that the House of Delegates hereby respectfully requests the Board of Trustees to procure through the United States government an investigation by some unbiased qualified expert of the pretensions of Osteopathy and of other allegedly healing cults.

The Board of Trustees took this resolution under consideration and will continue to keep it under surveillance until a proper and complete investigation is made and the results known.

Under *New Business* a great deal of time was spent in presenting resolutions for some type of socialized medicine, and it was, indeed, a surprise to have one of the prominent delegates from the New York Medical Association present resolutions and explain principles and proposals almost without limit in an effort to get the approval of the House on some form of socialized medicine. Dr. Samuel J. Kopetsky, of New York, had been invited by the President of the United States and the various groups seeking the formation of a National Department of Health, to spend a few weeks in Washington and there he soon became a chore boy to do their bidding and offered to deliver the medical profession over to the Federal Government for the politicians to feed upon.

Early in the session, a communication was received from Washington, D. C., from Senator J. H. Lewis, seeking a chance to address the House of Delegates on a new proposed order along social lines which he said would affect all professions and business in general. The House voted to hear the Senator on Thursday at 10:00 a. m. at which time Mr. Lewis appeared and pointed out that the Federal Government now has recognized its social responsibility to its citizens by the enactment of the Social Security Act, and declared that an extension of such responsibility is necessary to provide adequate medical care and attention for the impoverished and needy, in order to assure the full enjoyment of Social Security. Mr. Lewis led us to believe that he came at the request of the President of the United States and that the President knew what he was to talk about. Let me quote his exact words:

"I am pleased to tell you that as I left I called the President and told him I was on my way to have a conversation with you gentlemen. I would like to deliver from the President of the United States a message coming direct with his authority. He said that I was authorized to say to you, he knew something of your meeting, he had been for some time observing the courses of the doctor, that he was not far removed from constantly keeping up with the features of the profession and he wished you success in your undertaking. If I were to use his exact words, he hoped that you would find a way to cooperate with him in such methods as you would jointly find would be to the service of the helpless and the afflicted within such province as you felt the government should undertake. I deliver the message of the President and assure you it was a source of great pleasure that he understood I was to be here."

Mr. Lewis gave a most flowery and silver-tongued address in which he told the profession that they were soon to be officers of the government and would have to do the bidding of the Federal authority. They would be called to prove their right to be admitted to treat its citizens, licensed by the government and unlicensed whenever the service to its citizens did not suit its fancy. All physicians would be examined and licensed by the government every five years; the doctor and patient relationship would not be recognized any more, as the government recognizes only its citizens. The doctors would serve them, keep them in good health because citizens have votes and votes are power; keep its citizens free from disease so that they could produce more citizens, and lastly, keep its citizens physically fit so that they could serve the government whenever they were desired as soldiers.

Mr. Lewis would have all fees and bills sent to a committee for reference and adjustment and investigated whenever desired. All irregularities would be treated as direct instruments of fraud and offense against the government, and punished by

a fine of \$1,000 or demotion according to the findings of the auditing committee. He wished the House of Delegates to arrange a system of appointees who might sit in judgment on fees, methods of payment, and the quality and quantity of it. The doctors would be considered as medical servants under the orders of those who might call themselves political appointees. He asked about our wishes concerning the qualifications of the medical profession for the science service it would be capable of rendering to the citizens of the government.

Mr. Lewis had a lot of sting in the words he uttered and since it is impossible to take the time here to go over the address in detail, I urge each and every one of you to please read and digest every word of his address, which may be found in your *A. M. A. Journal* of June 26, 1937. You then will be a little better prepared for the shock you will get when you read the bill he introduced to the Senate six weeks later, on July 28, 1937.

The House of Delegates very wisely took the information of Mr. Lewis under advisement and referred it to the Board of Trustees.

After some study and discussion, it was considered wise to prepare some basic guide by which all medical groups, large or small, might guide themselves in considering any changes in the service now rendered the people of this country. We all know that the American Medical Association is an organization of physicians along strictly democratic lines; that it is one of the most truly representative bodies existing in this country. Why, then, any necessity for the circulation of petitions presenting proposals for fundamental changes in the nature of development, distribution and payment for medical services? Who may profit from such evidence of disorganization? Until the regularly chosen representatives of the 106,000 members of the A. M. A. determine, after due consideration, that some fundamental change or revolution is necessary, physicians will do well to abide by the principles which the House of Delegates has established.

The following ten points were suggested by the Judiciary Council of the American Medical Association.

1. All features of the medical service in any method of medical practice should be under the control of the medical profession. No other body or individual is legally or educationally equipped to exercise such control.

2. No third party must be permitted to come between the patient and his physician in any medical relation. All responsibility for the character of the medical service must be borne by the physician.

3. Patients must have absolute freedom to choose a duly qualified doctor of medicine who will serve them from among all those qualified to practice and who are willing to give the service.

4. The method of giving service must retain a permanent, confidential relation between the patient and a family physician. This relation must be the fundamental and dominating feature of any system.

5. All medical phases of all institutions involved in the medical service should be under professional control, it being understood the hospital service and medical service should be considered separately; these institutions being but the expansions of the equipment of the physician. He is the only one whom the laws of all nations recognize as competent to use them in the delivery of service. The medical profession alone can determine the adequacy and character of such institution. Their value depends on their operation according to medical standards.

6. However the cost of medical service may be distributed, the immediate cost should be borne by the patient if able to pay at the time the service is rendered.

7. Medical service must have no connection with the cash benefits.

8. Any form of medical service should include within its scope all qualified physicians of the locality covered by its operation who wish to give service under the conditions established.

9. Systems for the relief of low income classes should be limited strictly to those below the "comfort level" standard of incomes.

10. There should be no restrictions on treatment or prescribing not formulated and enforced by the organized medical profession.

If the organized medical men of the United States can unite to maintain these guiding points, we will not be integrated or sold by the politicians to be dictated to by Federal bosses under the whip of the President and the Congress of the United States.

The election of a president-elect was quite simple this year as Dr. Irvin Abell, of Louisville, Kentucky, was the only nominee and was elected by acclamation. Dr. Robert A. Peers of California nominated Dr. Junius B. Harris of Sacramento, California, for vice-president, and there being no other nominee he was elected by acclamation. All other officers were re-elected and will serve for another year.

The place of the next annual session was the final order of business. The invitation of the California Medical Association and the San Francisco County Society to meet in San Francisco in June, 1938, was unanimously accepted.

ADDRESS OF THE PRESIDENT-ELECT OF THE SOUTH DAKOTA STATE MEDICAL ASSOCIATION*

J. F. D. Cook, M.D.
Langford, South Dakota

Members of the House of Delegates; up to the present moment, the material for your consideration has been voluminous.

The most important will be our legislative program for the legislature of 1939. A committee was appointed to recommend a Basic Science bill for your consideration. I sense the fact that you will outline a legislative program.

May I suggest to the councilors and delegates, that you on your return to your component societies, make a report of the transactions of the Council and House of Delegates, in order that the members may be informed of program adopted.

President Pittenger has outlined specifically the needs of our association and I will not elaborate.

Farmers' Aid Corporation Understanding. I request that you give this careful consideration; the advisability of its continuance beyond the time agreed upon, should be considered. However, it is my personal opinion, from observation, that it be allowed a simple demise at the end of the year.

I desire to compliment Dr. Dyar and those administering this program of aid to the farmers. I feel that he has done everything possible in the administration. He is to be commended for his coöperation.

In outlining a program for legislative activity, I submit the following outline for the consideration of the component societies and its officers in particular.

Whenever a medical organization plans a major legislative program, the subject of political activity comes up for consideration, and plans are laid for such activity.

Political parties come and go, candidates have their spot in the sun and are cast into shadows; but medical societies in some form or other have existed since the Vedic hymns were written in India, six thousand years B. C., and may be expected to continue while there is need of doctors.

Our sins will be remembered longer than those of other groups because retribution will always be able to find us. Candidates for office can go back to work, and their words forgotten. Political parties can change their names and the song they sing; office-holders can be turned out by a new set of office holders; but doctors will still remain outstanding and permanent members of the community, and answerable individually for whatever they may do collectively.

In the tumult of the coming campaign, the temptations to partisanship will be many. Certainly individual doctors may take a position for or against candidates or parties as they find personal preference for one or another. It is not the concern of organized medicine to discourage partisanship on the part of the physician as an individual. But it is the concern of organized medicine to avoid the vortex of politics by any group affiliation with particular parties. It is the concern of organized medicine to maintain political impartiality and to be particularly careful not only to appear to do so, but actually to do so.

However, as the political campaign progresses, it is probable that matters which especially concern the medical profession will become issues in the campaign. On these, there is no question of the right, and even the obligation, of organized medicine to become active in the promotion of the policies of those who may be candidates for office, and also openly active in efforts to elect or defeat particular candidates whose position on these subjects is known, or can be made known. It is important in this regard that it be made clear to the candidate and the public that such activity is not intended to imply approval or opposition toward a political party or individual in general. It is based solely on the candidate's position on important medical measures in which the public's interest becomes that of organized medicine because the medical profession is the natural guardian of the peoples' health. Attitudes should be carefully impersonal, non-partisan.

The point should be made unmistakably clear that measures are advocated or opposed because they affect the welfare of the public in a medical aspect, rather than that they subject medicine to lay control or interfere with the private practice of medicine. The public does not appreciate that these two views are the same—that what is for the benefit of organized medicine is also for the benefit of the public; and that what is for the benefit of the public is for the benefit of the doctor. So it is not enough that a medical society state its position on a matter—the reason should be explained.

With a little effort, this can be done so that the average person will know and appreciate why the stand was taken, and know that it is not a matter of party, but principle.

The average person's approval is important. He is often the unseen arbiter of legislation. It is decidedly to the advantage of the physicians as a group to take care that the public is informed as fully as possible on all controversial public questions pertaining to medicine.

* Read before the House of Delegates of the South Dakota State Medical Association, May 10, 1938, Huron, S. D.

Opportunities to make ourselves clear in this way are created during political campaigns, when candidates may be asked publicly to declare themselves. Communications asking them to do so, together with their replies, may be given to the local press, choosing suitable occasions.

District medical societies may properly ask candidates how they stand on such questions as pertain to medicine. Later in the campaign questions may be made more specific; in fact, issues may be drawn in such a manner as to present questions in greater detail.

Preparations may be made during the summer to designate officers of the district society who are to make contacts with candidates. At the most suitable time during the campaign, statements may be elicited from these men on questions that are of the moment preservation of the best in medical care in South Dakota.

1. Hold monthly meetings for the sole purpose of discussing methods of procedure. Invite to the meeting legislators in your respective district. Present to them the needs of new legislation to standardize medical care in South Dakota, in order to keep abreast with medical progress in other states.

2. See that district committees, with the assistance of the officers, present the legislative program at such meetings.

3. Explain that the proposed legislation is not retroactive: that such legislation will not affect the men duly licensed in the state—that this legislation will be a protection to the citizens of the state in raising the standard of admission to meet the reciprocal relations with sister states.

Such legislation will prevent the unqualified from being dumped on South Dakota.

SOUTH DAKOTA STATE MEDICAL ASSOCIATION ROSTER - 1938

Membership by Districts

ABERDEEN DISTRICT No. 1

PRESIDENT		
Ranney, T. P.	.....	Aberdeen
SECRETARY		
Bruner, J. E.	.....	Aberdeen
Adams, J. F.	.....	Aberdeen
Alway, J. D.	.....	Aberdeen
Baer, T. H.	.....	Timber Lake
Bates, W. A.	.....	Aberdeen
Bloemendaal, G. J.	.....	Ipswich
Brenckle, J. F.	.....	Mellette
Brinkman, W. C.	.....	Veblen
Bruner, J. E.	.....	Aberdeen
Bunker, Paul	.....	Aberdeen

Calene, J. L.	.....	Aberdeen
Cook, J. F. D.	.....	Langford
Drissen, E. M.	.....	Britton
Eckrich, J. A.	.....	Aberdeen
Gelber, R. M.	.....	Aberdeen
Graff, Leo W.	.....	Britton
Hill, Robert	.....	Ipswich
Jones, T. D.	.....	Bowdle
Keegan, Agnes	.....	Aberdeen
Keller, Ted	.....	Leola
King, H. I.	.....	Aberdeen
King, Owen	.....	Aberdeen
Kraushaar, J. O. E.	.....	Aberdeen
Lowe, C. E.	.....	Mobridge

McCarthy, Paul	.....	Aberdeen
Murdy, B. C.	.....	Aberdeen
Murphy, T. W.	.....	Bristol
Pittenger, A. E.	.....	Aberdeen
Potter, G. W.	.....	Redfield
Ranney, T. P.	.....	Aberdeen
Rice, D. B.	.....	Britton
Rudolph, E. A.	.....	Aberdeen
Sarchet, Geo. A.	.....	Mobridge
Scallin, Paul R.	.....	Redfield
Spirey, A. W.	.....	Mobridge
Stephens, E. E.	.....	Eureka
Whiteside, J. D.	.....	Aberdeen
Zachritz, J. F.	.....	Faulkton

WATERTOWN DISTRICT No. 2

PRESIDENT		
Randall, O. S.	.....	Watertown
SECRETARY		
Adams, M. E.	.....	Clark
Adams, M. E.	.....	Clark
Aldrich, H. J.	.....	Watertown
Bates, J. S.	.....	Clear Lake
Barton, H. J.	.....	Watertown
Brown, H. R.	.....	Watertown

Christensen, A. H.	.....	Clark
Freeburg, M. H.	.....	Watertown
Hammond, M. J.	.....	Watertown
Johnson, A. E.	.....	Watertown
Jorgenson, M. C.	.....	Watertown
Kenney, H. T.	.....	Watertown
Kilgard, R. M.	.....	Watertown
Koren, F.	.....	Watertown
Lockwood, J. H.	.....	Henry

Magee, W. G.	.....	Watertown
McIntyre, P. S.	.....	Bradley
Randall, O. S.	.....	Watertown
Richards, Geo.	.....	Watertown
Schmidt, Hilmer	.....	Chicago, Ill.
Sherwood, H. W.	.....	Doland
*Tarball, H. A.	.....	Watertown
Vaughn, J. B.	.....	Castlewood
Watson, E. S.	.....	Estelline

MADISON DISTRICT No. 3

PRESIDENT		
Whitson, G. E.	.....	Madison
SECRETARY		
Baughman, D. S.	.....	Madison
Baughman, D. S.	.....	Madison
Davidson, Magni	.....	Brookings
Engleson, C. J.	.....	Brookings
Farnsworth, C. P.	.....	Canova
Grove, E. H.	.....	Arlington

Gulbrandsen, G. H.	.....	Brookings
Hopkins, N. K.	.....	Arlington
Jordon, L. E.	.....	Chester
Kellogg, H. E.	.....	Brookings
Miller, H. A.	.....	Brookings
Mokler, V. A.	.....	Wentworth
Muggly, J. A.	.....	Madison
Peeke, A. P.	.....	Volga
Scanlan, D. L.	.....	Volga

**Searles, E. R.	.....	Brookings
Sherwood, C. E.	.....	Madison
Tank, M. C.	.....	Brookings
Tillisch, H.	.....	Brookings
*Torwick, E. E.	.....	Volga
Torwick, E. T.	.....	Volga
Westaby, J. R.	.....	Madison
Westaby, R. S.	.....	Madison
Whitson, G. E.	.....	Madison
Willoughby, F. C.	.....	Howard

PIERRE DISTRICT No. 4

PRESIDENT		
Salladay, I. R.	Pierre	
SECRETARY		
Morrissey, M. M.	Pierre	
Burgess, R. E.	Gettysburg	
Collins, E. H.	Gettysburg	
Creamer, F. H.	Dupree	

Dyar, B. A.	Pierre
Embree, V. W.	Onida
Hart, B. M.	Onida
Jenkins, P. B.	Pierre
Jordan, A. A.	Highmore
Kimble, O. A.	Murdo
Morrissey, M. M.	Pierre
Martin, H. B.	Harrold

McLaurin, A. A.	Pierre
Murphy, Joseph	Murdo
Northrup, F. A.	Pierre
Ramsey, Guy	Philip
Riggs, T. F.	Pierre
Robbins, C. E.	Pierre
Salladay, I. R.	Pierre

HURON DISTRICT No. 5

PRESIDENT		
Grosvenor, L. M.	Huron	
SECRETARY		
Lenz, Bernard	Huron	
Buchanan, R. A.	Huron	
Burman, G. E.	Carthage	

Class, F. L.	Huron
Griffith, W. H.	Huron
Grosvenor, L. M.	Huron
Hagin, J. C.	Miller
Lenz, B. T.	Huron
Pangburn, M. W.	Miller
Saxton, W. H.	Huron

Saylor, H. L.	Huron
Sewell, H. D.	Huron
Shirley, J. C.	Huron
Tschetter, J. S.	Huron
Tschetter, Paul	De Smet
Wright, O. R.	Huron

MITCHELL DISTRICT No. 6

PRESIDENT		
Lloyd, J. H.	Mitchell	
SECRETARY		
McGreevy, J. V.	Mitchell	
Ball, W. R.	Mitchell	
Beukelman, W. H.	Stickney	
Bobb, B. A.	Mitchell	
Bobb, C. S.	Mitchell	

Boyd, F. E.	Mitchell
Delaney, Wm. A.	Mitchell
Dick, L. C.	Spencer
Frink, Raymond	Wessington Springs
Gifford, A. J.	Alexandria
Gillis, F. D.	Mitchell
Hoyne, A. H.	Salem
Jones, E. W.	Mitchell
Kelly, R. A.	Mitchell

Lloyd, J. H.	Mitchell
Mabee, D. R.	Mitchell
Mabee, O. J.	Mitchell
Maytum, W. J.	Alexandria
McGreevy, J. V.	Mitchell
Nelson, J. A.	Howard
Reib, Wm. G.	Parkston
Tobin, F. J.	Mitchell
Weber, R. A.	Mitchell
Young, E. M.	Mitchell

SIOUX FALLS DISTRICT No. 7

PRESIDENT		
Nessa, N. J.	Sioux Falls	
SECRETARY		
Hummer, H. R.	Sioux Falls	
Billingsley, P. R.	Sioux Falls	
Billion, T. J.	Sioux Falls	
Brandon, P. E.	Sioux Falls	
Carney, Myrtle S.	Sioux Falls	
Clark, J. C.	Sioux Falls	
Cottam, G. I. W.	Sioux Falls	
*Craig, D. W.	Sioux Falls	
Culver, Chas. F.	Sioux Falls	
Dehli, H. M.	Colton	
DeVall, F. C.	Garretson	
Dickenson, W. E.	Canistota	
Donahoe, Stephen A.	Sioux Falls	
Donahoe, W. E.	Sioux Falls	

Dulaney, C. H.	Canton
Eagan, J. B.	Dell Rapids
Engelcke, R. H.	Viborg
Erickson, E. G.	Sioux Falls
Erickson, O. Chas.	Sioux Falls
Gage, E. E.	Sioux Falls
Gregg, J. B.	Sioux Falls
Groebner, O. A.	Sioux Falls
Grove, A. F.	Dell Rapids
Hanson, O. L.	Valley Spring
Hummer, H. R.	Sioux Falls
Hyden, Anton	Sioux Falls
Keller, S. A.	Sioux Falls
Kittelson, J. A.	Sioux Falls
Lamb-Barger, Hazel H.	Sioux Falls
Lanam, M. O.	Sioux Falls
Leraan, L. G.	Sioux Falls
McDonald, C. J.	Sioux Falls

Moe, A. J.	Sioux Falls
Mueller, J. D.	Flandreau
Mullen, R. W.	Sioux Falls
Nessa, N. J.	Sioux Falls
Nilsson, F. C.	Sioux Falls
Opheim, O. V.	Sioux Falls
Pankow, L. J.	Sioux Falls
Parke, L. L.	Canton
*Perkins, E. L.	Sioux Falls
*Posthuma, Anne	Sioux Falls
Reagan, Resin	Sioux Falls
Rider, A. S.	Flandreau
*Roberts, W. P.	Sioux Falls
Stenberg, E. S.	Sioux Falls
Stevens, Geo. A.	Sioux Falls
Stevens, R. G.	Sioux Falls
Van Demark, G. E.	Sioux Falls
Zimmerman, Goldie	Sioux Falls

YANKTON DISTRICT No. 8

PRESIDENT		
Smith, A. J.	Yankton	
SECRETARY		
Hohf, J. A.	Yankton	
Abts, F. J.	Yankton	
Adams, G. S.	Yankton	
Andre, H. C.	Vermillion	
Beall, L. F.	Irene	
Blezek, F. M.	Tabor	
Brookman, L. J.	Vermillion	
Bury, Chas. F.	Geddes	
Bushnell, J. W.	Elk Point	
Bushnell, Wm. F.	Elk Point	

Crecelius, H. A.	Plains, Mont.
Fairbanks, W. H.	Vermillion
Freshour, Ina Moore	Yankton
Greenfield, J. C.	Avon
Haas, F. W.	Yankton
Hansen, H. F.	Vermillion
Hill, J. F.	Yankton
Hohf, J. A.	Yankton
Hohf, S. M.	Yankton
Hubner, R. F.	Tripp
Johnson, Geo. E.	Yankton
Joyce, E.	Hurley
Kalayjian, D. S.	Parker
Kauffman, E. J.	Marion
Keeling, C. M.	Springfield
Landmann, G. A.	Scotland

Leonard, B. B.	Yankton
Lietzke, E. T.	Beresford
Moore, F. A.	Yankton
Morehouse, E. M.	Yankton
Murphy, J. C.	Yankton
Neisius, J. A.	Platte
Ohlmacher, J. C.	Vermillion
Reding, A. P.	Marion
Scallin, Paul R.	Redfield
Smith, A. J.	Yankton
Stansbury, E. M.	Vermillion
Trierweiler, J. E.	Yankton
Willhite, F. V.	Redfield
Williams, F. E.	Wakonda
Wynegar, D. E.	Yankton
Conner, E. I.	Alcester

BLACK HILLS DISTRICT No. 9

PRESIDENT		Geyerman, P. T.	Hot Springs	Newby, H. D.	Rapid City
Ewald, P. P.	Lead	Hare, Carlyle	Spearfish	O'Toole, T. F.	New Underwood
SECRETARY		Heilesen, W. E.	Custer	Pemberton, M. O.	Deadwood
Jernstrom, R. E.	Rapid City	Howe, F. S.	Deadwood	Radusch, Freida J.	Rapid City
Bestgen, Fred P.	Sturgis	Hultz, E. B.	Hill City	Richards, F. A.	Sturgis
Bilger, F. W.	Hot Springs	Hummer, F. L.	Lead	Richardson, W. E.	Philip
Butler, J. M.	Hot Springs	Ince, H. J. T.	Rapid City	Sherman, K. E.	Sturgis
Chassell, J. L.	Belle Fourche	Jackson, A. S.	Lead	Sherrill, S. F.	Belle Fourche
Clark, O. H.	Newell	Jackson, R. J.	Rapid City	Sherwood, J. V.	Sanator
Crane, H. L.	L'Orya, Peru	Jernstrom, R. E.	Rapid City	Smiley, J. C.	Deadwood
Davidson, H. E.	Lead	Kegaries, D. I.	Rapid City	Soe, Carl A.	Lead
Dawley, W. A.	Rapid City	Lemley, R. E.	Rapid City	Spain, M. L.	Hot Springs
Dickinson, J. H.	Buffalo	Mattox, N. E.	Lead	Stewart, J. L.	Nemo
Doyle, Jas. I.	Rapid City	Mill, G. W.	Wall	Stewart, N. W.	Lead
Ewald, P. P.	Lead	Munty, F. W.	Rapid City	Threadgold, J. O.	Belle Fourche
Fleeger, R. B.	Lead	Morse, W. E.	Rapid City	Triolo, Anthony	Buffalo
		Morsman, C. F.	Hot Springs	Zarbaugh, G. F.	Deadwood

ROSEBUD DISTRICT No. 10

PRESIDENT		Carmack, A. O.	Colome	Quinn, R. J.	Burke
Carmack, A. O.	Colome	Malster, R. M.	Carter	Walters, S. J.	Winner
SECRETARY		Overton, R. V.	Winner	Wilson, F. D.	Winner
Overton, R. V.	Winner				

WHETSTONE VALLEY DISTRICT No. 12

PRESIDENT		Cliff, F. N.	Milbank	Peabody, H. C.	Sisseton
Pfister, F.	Webster	Duncan, William	Webster	Peabody, P. D. Jr.	Webster
SECRETARY		Gregory, D. A.	Milbank	Peabody, P. D. Sr.	Webster
Peabody, P. D. Jr.	Webster	Hawkins, A. P.	Waubay	Pearson, A. W.	Sisseton
		Jacotel, J. A.	Milbank	Pfister, Faris	Webster
		Karlins, W. H.	Webster	Porter, O. M.	Sisseton

* *Honorary.*** *Associate.*

ROSTER

South Dakota State Medical Association--1938

Abts, F. J.	Yankton	Brookman, L. J.	Vermillion	Crane, H. L.	L'Orya, Peru, S. A.
Adams, G. S.	Yankton	Brown, H. R.	Watertown	Creamer, F. H.	Dupree
Adams, J. F.	Aberdeen	Bruner, J. E.	Aberdeen	Crecelius, H. A.	Plains, Mont.
Adams, M. E.	Clark	Buchanan, R. A.	Huron	Culver, C. F.	Sioux Falls
Aldrich, H. J.	Watertown	Buekelman, W. H.	Stickney	Davidson, H. E.	Lead
Alway, J. D.	Aberdeen	Bunker, Paul	Aberdeen	Davidson, Magni	Brookings
Andre, H. C.	Vermillion	Burgess, R. E.	Gettysburg	Dawley, W. A.	Rapid City
Ball, W. R.	Mitchell	Burman, G. E.	Carthage	Dehli, H. M.	Colton
Bartron, H. J.	Watertown	Bury, Chas. L.	Geddes	Delaney, Wm. A.	Mitchell
Bates, J. S.	Clear Lake	Bushnell, J. W.	Elk Point	De Vall, F. C.	Garretson
Bates, W. A.	Aberdeen	Bushnell, W. F.	Elk Point	Dick, L. C.	Spencer
Baughman, D. S.	Madison	Butler, J. M.	Hot Springs	Dickenson, J. H.	Buffalo
Beall, L. F.	Irene	Calene, J. L.	Aberdeen	Dickenson, W. E.	Canistota
Baer, T. H.	Timber Lake	Carmack, A. O.	Colome	Donahoe, S. A.	Sioux Falls
Bestgen, E. P.	Sturgis	Carney, M. S.	Sioux Falls	Donahoe, W. E.	Sioux Falls
Bilger, F. W.	Hot Springs	Chassell, J. L.	Belle Fourche	Doyle, Jas. I.	Rapid City
Billingsley, P. R.	Sioux Falls	Christensen, A. H.	Clark	Drissen, E. M.	Muskogee, Okl.
Billion, T. J.	Sioux Falls	Clark, J. C.	Sioux Falls	Dulaney, C. H.	Canton
Blezek, F. M.	Tabor	Clark, O. H.	Newell	Duncan, William	Webster
Bloemendaal, G. J.	Ipswich	Class, F. L.	Huron	Dyar, B. A.	Pierre
Bobb, B. A.	Mitchell	Cliff, F. N.	Milbank	Eagan, J. B.	Dell Rapids
Bobb, C. S.	Mitchell	Collins, E. H.	Gettysburg	Eckrick, J. A.	Aberdeen
Boyd, Frank	Mitchell	Conner, E. I.	Alcester	Embree, V. W.	Onida
Brandon, P. E.	Sioux Falls	Cook, J. F. D.	Langford	Engelcke, R. H.	Viborg I.s.
Brenckle, J. F.	Mellette	Cottam, G. I. W.	Sioux Falls	Engelson, C. J.	Brookings
Brinkman, W. C.	Veblen	*Craig, D. W.	Sioux Falls	Erickson, E. G.	Sioux Falls

Erickson, O. C.	Sioux Falls	King, Owen	Aberdeen	Ranney, T. P.	Aberdeen
Ewald, P. P.	Lead	Kittelson, J. A.	Sioux Falls	Reagan, Rezin	Sioux Falls
Fairbanks, W. H.	Vermillion	Koren, F.	Watertown	Reding, A. P.	Marion
Farnsworth, C. P.	Canova	Kraushaar, F. J. O.	Aberdeen	Rice, D. B.	Britton
Fleeger, R. B.	Lead	Lamb-Barger, Hazel H.	Sioux Falls	Richards, G. H.	Watertown
Freeburg, H. M.	Watertown	Lanam, M. O.	Sioux Falls	Richards, F. A.	Sturgis
Freshour, Ina Moore	Yankton	Landmann, G. A.	Scotland	Richardson, W. E.	Philip
Frink, Raym. Wessington	Springs	Lemley, R. E.	Rapid City	Rider, A. S.	Flandreau
Gage, E. E.	Sioux Falls	Lenz, B. T.	Huron	Rieb, Wm. G.	Parkston
Gelber, M. R.	Aberdeen	Leonard, B. B.	Yankton	Riggs, T. F.	Pierre
Geyerman, P. T.	Hot Springs	Leraan, L. G.	Sioux Falls	Robbins, C. E.	Pierre
Gifford, A. J.	Alexandria	Lietzke, E. T.	Beresford	*Roberts, W. P.	Sioux Falls
Gillis, F. D.	Mitchell	Lloyd, J. H.	Mitchell	Rudolph, E. A.	Aberdeen
Graff, L. W.	Britton	Lockwood, J. H.	Henry	Salladay, I. R.	Pierre
Gregg, J. B.	Sioux Falls	Lowe, C. E.	Mobridge	Sarchet, Geo. A.	Mobridge
Gregory, D. A.	Milbank	Mabee, D. R.	Mitchell	Saxton, W. H.	Huron
Greenfield, J. C.	Avon	Mabee, O. J.	Mitchell	Saylor, H. I.	Huron
Griffith, W. H.	Huron	Magee, W. G.	Watertown	Scallin, Paul R.	Redfield
Groebner, O. A.	Sioux Falls	Malster, R. M.	Carter	Scanlon, D. L.	Volga
Grove, A. F.	Dell Rapids	Martin, H. B.	Harrold	Schmidt, Hilmer	Chicago, Ill.
Grove, E. H.	Arlington	Mattox, N. E.	Lead	**Searles, E. R.	Brookings
Guldbrandsen, G. H.	Brookings	Maytum, W. J.	Alexandria	Sewell, H. D.	Huron
Grosvenor, L. M.	Huron	McCarthy, P. V.	Aberdeen	Sherman, K. E.	Sturgis
Haas, F. W.	Yankton	McDonald, C. J.	Sioux Falls	Sherwood, C. E.	Madison
Hagin, J. C.	Miller	McGreevy, J. V.	Mitchell	Sherwood, H. W.	Doland
Hansen, H. F.	Vermillion	McIntyre, P. S.	Bradley	Sherwood, J. V.	Sanator
Hanson, O. L.	Valley Springs	McLaurin, A. A.	Pierre	Sherrill, S. F.	Belle Fourche
Hammond, M. J.	Watertown	Miller, H. A.	Brookings	Shirley, J. C.	Huron
Hare, Carlyle	Spearfish	Mills, G. W.	Wall	Smiley, J. C.	Deadwood
Hart, B. M.	Onida	Minty, F. W.	Rapid City	Smith, A. J.	Yankton
Hawkins, A. P.	Waubay	Moe, A. J.	Sioux Falls	Soe, Carl F.	Lead
Heilesen, W. E.	Custer	Mokler, V. A.	Wentworth	Spain, M. L.	Hot Springs
Hill, J. F.	Yankton	Moore, F. A.	Yankton	Spirey, A. W.	Mobridge
Hill, Robert	Ipswich	Morehouse, E. M.	Yankton	Stenberg, E. S.	Sioux Falls
Hohf, J. A.	Yankton	Morse, W. E.	Rapid City	Stansbury, E. M.	Vermillion
Hohf, S. M.	Yankton	Morseman, C. F.	Hot Springs	Stephens, E. E.	Eureka
Hopkins, N. K.	Arlington	Morrissey, M. M.	Pierre	Stewart, J. L.	Nemo
Howe, F. S.	Deadwood	Mueller, J. D.	Flaudreau	Stewart, N. W.	Lead
Hoyle, A. H.	Salem	Muggly, J. A.	Madison	Stevens, G. A.	Sioux Falls
Hubner, R. F.	Tripp	Mullen, R. W.	Sioux Falls	Stevens, R. G.	Sioux Falls
Hummer, F. L.	Lead	Murphy, B. C.	Aberdeen	Tank, M. C.	Brookings
Hummer, H. R.	Sioux Falls	Murphy, J. C.	Yankton	*Tarbell, H. A.	Watertown
Hultz, E. B.	Hill City	Murphy, Joseph	Murdo	Threadgold, J. O.	Belle Fourche
Hyden, Anton	Sioux Falls	Murphy, T. W.	Bristol	Tillisch, Henrick	Brookings
Ince, H. J. T.	Rapid City	Neisius, J. A.	Platte	Tobin, F. J.	Mitchell
Jackson, A. S.	Lead	Nelson, J. A.	Howard	*Torwick, E. E.	Volga
Jackson, R. J.	Rapid City	Nessa, N. J.	Sioux Falls	Torwick, E. T.	Volga
Jacotel, J. A.	Milbank	Newby, H. D.	Rapid City	Trierweiler, J. E.	Yankton
Jenkins, P. B.	Pierre	Nilsson, F. C.	Sioux Falls	Triolo, Antony	Buffalo
Jernstrom, R. E.	Rapid City	Northrup, F. A.	Pierre	Tschetter, J. S.	Huron
Johnson, A. E.	Watertown	Ohlmacher, J. C.	Vermillion	Tschetter, Paul	De Smet
Johnson, G. E.	Yankton	Opheim, O. V.	Sioux Falls	Vaughn, J. B.	Castlewood
Jones, E. W.	Mitchell	O'Toole, T. F.	New Underwood	Walters, S. J.	Winner
Jones, T. D.	Bowdle	Overton, R. V.	Winner	Watson, E. S.	Estelline
Jordan, L. E.	Chester	Pangburn, M. W.	Miller	Weber, R. A.	Mitchell
Jordan, A. A.	Highmore	Pankow, L. J.	Sioux Falls	Westaby, J. R.	Madison
Jorgenson, M. C.	Watertown	Parke, L. L.	Canton	Westaby, R. S.	Madison
Joyce, E.	Hurley	Peabody, H. C.	Sisseton	Whiteside, J. D.	Aberdeen
Kalayjian, D. S.	Parker	Peabody, P. D. Jr.	Webster	Whitson, Geo. E.	Madison
Karlins, W. H.	Webster	Peabody, P. D. Sr.	Webster	Willhite, F. V.	Redfield
Kauffman, E. J.	Marion	Pearson, A. W.	Sisseton	Williams, F. E.	Wakonda
Keegan, Agnes	Aberdeen	Peeke, A. P.	Volga	Willoughby, F. C.	Howard
Keeling, C. M.	Springfield	Pemberton, M. O.	Deadwood	Wilson, F. D.	Winner
Kegaries, D. L.	Rapid City	*Perkins, E. L.	Sioux Falls	Wright, O. R.	Huron
Keller, Ted	Leola	Pfister, F. A.	Webster	Wynegar, D. E.	Yankton
Keller, S. A.	Sioux Falls	Pittenger, E. A.	Aberdeen	Young, E. M.	Mitchell
Kellogg, H. E.	Brookings	Potter, G. W.	Redfield	Zachritz, G. F.	Faulton
Kelly, R. A.	Mitchell	Porter, O. M.	Sisseton	Zarbaugh, G. F.	Deadwood
Kenney, H. T.	Watertown	*Posthuma, Anne	Sioux Falls	Zimmerman, Goldie E.	Sioux Falls
Kilgard, R. M.	Watertown	Quinn, R. J.	Burke		
Kimble, O. A.	Murdo	Radusch, Frieda J.	Rapid City		
King, H. I.	Aberdeen	Ramsey, Guy	Philip		
		Randall, O. S.	Watertown		

* Honorary members.

** Associate members.

Transactions of the Medical Association of Montana Business Meeting

Sixtieth Annual Session

Livingston, Montana

April 25, 26, 1938

OFFICERS, 1938-1939

PRESIDENT-ELECT	
H. W. GREGG, M.D.	Butte
VICE-PRESIDENT	
E. S. MURPHY, M.D.	Missoula
SECRETARY-TREASURER	
T. L. HAWKINS, M.D.	Helena
DELEGATE TO A. M. A.	
J. H. IRWIN, M.D.	Great Falls
ALTERNATE	
E. M. GANS, M.D.	Harlowton
COUNCILLORS	
F. B. ROSS, M.D.	Kalispell
S. A. COONEY, M.D.	Helena
P. E. KANE, M.D.	Butte
M. B. HESDORFFER, M.D.	Missoula
L. G. DUNLAP, M.D.	Anaconda
R. D. KNAPP, M.D.	Wolf Point
L. T. SUSSEX, M.D.	Havre
J. I. WERNHAM, M.D.	Billings
A. D. BREWER, M.D.	Bozeman
J. H. GARBERSON, M.D.	Miles City
E. A. WELDEN, M.D.	Lewistown
E. D. HITCHCOCK, M.D.	Great Falls

ANNUAL MEETING OF THE COUNCIL OF THE MEDICAL ASSOCIATION OF MONTANA

April 25, 1938 — Murray Hotel
Livingston, Montana

Those present were: Drs. L. G. Dunlap, L. T. Sussex, E. D. Brewer, J. H. Garberson, E. A. Welden, J. I. Wernham, E. S. Murphy and M. Smetters.

The minutes of the last meeting, held in Great Falls, July 13th and 14th, 1937, were read, and approved as read without corrections.

The report of the secretary for the year 1937 and 1938 was read.

The treasurer's report, which consisted of examination of the books by Hugh D. Galusha, Certified Public Accountant, was read and accepted.

The Chairman of the Maternal and Child Health Committee, Dr. Frank L. McPhail, reported at length on the activities of his committee. Dr. McPhail spoke of the importance of a program to decrease infant and maternal mortality in Montana, by proper coöperation and questionnaires sent to all members doing obstetrics.

Dr. J. C. MacGregor reported as Chairman of the Committee on Medical Defense, on the work accomplished during the past year in decreasing the number of malpractice suits in the State.

Dr. E. M. Gans reported for the committee on the Constitution and By-Laws stating that he would have recommendations to present to the House of Delegates.

Dr. J. J. Malee, Chairman of the Program Committee, reported on the Postgraduate Meetings held during the past year. The meetings were held in coöperation with the State Board of Health. Considerable discussion arose from Dr. Malee's report. Some members were opposed to the meetings and others were in favor of them. No definite action was taken.

The Publication Committee's report was presented by Dr. J. A. Evert, who suggested that following the expiration of the contract with THE JOURNAL-LANCET, a mimeograph sheet

be published until we could arrive at a definite decision as to an official journal.

Dr. J. C. Shields suggested the establishment of a Public Relations Committee, whose function would be to organize through and suggest to County Public Relations Committees their activities and duties in supplying the public with reliable medical information through the radio, newspapers and public addresses.

Dr. R. F. Peterson spoke on the possibility of money being available from federal funds appropriated for the fight against venereal disease to be used by commercial laboratories for their work and requested instructions relative to fees for this work.

It was moved, seconded and passed that Mr. E. G. Toomey be retained as the association attorney for the coming year at the same fee.

Dr. F. E. Attix spoke on the "Medical Control Bureau" and warned against the inclusion of the Industrial Accident Board in any service bureau or contract arrangement.

There being no further business the Council adjourned.

ANNUAL MEETING OF THE HOUSE OF DELEGATES OF THE MEDICAL ASSOCIATION OF MONTANA

April 26, 1938

The meeting of the House of Delegates was called to order by the President, Dr. Wm. P. Smith, on April 26, 1938, at the Masonic Temple, Livingston, Montana.

The certificates of the delegates from the various societies were examined and found to be in order.

The minutes of the last meeting, held in Great Falls, July 13th and 14th, 1937, were read and approved as read.

The report of the secretary of activities since the last meeting was read.

The report of the treasurer, including the statement of a Certified Public Accountant was read and approved as read. It was stated in the treasurer's report that expenses in the last year greatly exceeded the Association's income, considerable of this being due to unusual expenses, not ordinarily incurred.

It was moved and seconded that all rules be suspended and that the Association be therefore without a Constitution. *Motion carried.*

It was moved and seconded that an annual meeting be held once a year, to consist of three days, the first two days being devoted to scientific sessions and the last day entirely to a business session. *Motion carried.*

The first order of business was the adoption of the Constitution. The proposed Constitution was read, article by article, and section by section, each article and section being independently voted upon. It was moved, seconded and passed by articles and sections, and generally accepted.

Dr. J. C. Shields moved that all past officers be elected. *Motion was seconded and passed.*

It was moved, seconded and passed that the Legislative Committee take up, section by section, the Medical Bureau Act and that a revision be made of the Medical Practice Act, in conjunction with the Executive Committee.

There was considerable discussion relative to the advisability of a re-registration law.

A motion was made, seconded and passed that the report of the Legislative Committee and the Medical Bureau Committee and their recommendations be referred to the Executive Committee and the Medical Practice Act Committee with power to act.

It was moved and seconded, it be the sense of the House of Delegates that a recommendation be directed to the State

Board of Examiners of the State of Montana, recommending that the salary of the Superintendent of the Montana State Tuberculosis Sanitarium be raised from four to five thousand dollars a year, a copy of this resolution to be sent to the State Board of Examiners:

"Whereas, there is a discrepancy in the salaries of the Superintendent of the Montana Hospital for the Insane and the Superintendent of the Montana State Tuberculosis Sanitarium and the same skilled medical qualifications are required of both these Superintendents, and

"Whereas, the salary of the Superintendent of the Montana State Tuberculosis Sanitarium is only four thousand dollars per annum and the salary of the Superintendent of the Montana State Hospital for the Insane is five thousand dollars per annum,

"Be it further resolved, that Dr. S. A. Cooney, Chairman of the Legislative Committee of the Medical Association of Montana, be instructed to present a copy of this resolution to the State Board of Examiners and interview them relative to the sense of this resolution."

This was carried by an unanimous standing vote.

It was moved, seconded and passed that the Legislative Committee use whatever means practical to induce members to become candidates for the State Legislature. It was the sense of this motion that the Legislative Committee have power to act as they may see fit in accepting this proposition.

Dr. J. H. Irwin reported on the activities of the Committee on History of Medicine and Biographies. The History of Medicine in Montana is progressing satisfactorily and within a short time will be ready for the printer. Dr. Irwin stated that when completed it would not only be an excellent history of medicine in Montana, but would be an authentic treatise on the history of Montana itself.

The Committee on Dentists, Pharmacists and Nurses was reported on by Dr. H. W. Gregg.

Dr. J. C. MacGregor, Chairman of the Medical Defense Committee, reported at length on the program made by this committee in reducing the number of malpractice suits, during the past three years. It was his opinion and the opinion of the Committee that the work should be vigorously prosecuted at all times.

Dr. Frank L. McPhail, Chairman of the Maternal and Child Health Committee, read an excellent report of his committee with recommendations which were adopted.

Dr. J. C. Shields, Chairman of the Economics Committee, presented a detailed report with proposals which were adopted.

The report of the Tuberculosis Committee was given by Dr. F. I. Terrill. The report was adopted.

Dr. J. J. Malee reported on the activities of the Program Committee, during the past year. A motion was made, seconded, that no more postgraduate meetings be held. *The motion was lost.* A motion was made, seconded, that the House of Delegates endorse postgraduate medical meetings, whose expenses were defrayed by federal funds. *The motion was lost.*

A motion was made, seconded and passed that a five-day postgraduate meeting be held this fall if satisfactory arrangements could be made with the speakers intented to be in attendance at the Idaho meeting, the decision in the matter being left to the Executive and Program Committee.

Dr. J. A. Evert made a motion which was seconded and passed that eight dollars (\$8.00) be charged as an attendance fee at the postgraduate meeting and that any deficit be made up from funds of the State Association.

Dr. H. H. James invited the State Association to meet in Butte in 1939. The motion was made, seconded and passed that the invitation from Butte be accepted, and the exact date be set by the Program and Executive Committee.

A motion was made by Dr. Tom Walker, seconded and passed, that the officers meet with the Governor relative to

appointments from the list submitted to the Governor for vacancies occurring on the State Board of Health and that the Executive Committee be empowered to act for the Medical Association in any decision to be made.

Dr. L. G. Dunlap presented a plan of insurance from the Lincoln National Life Insurance Company, as group insurance for physicians. A motion was made, seconded and passed that this matter be investigated by the Insurance Committee.

Dr. J. A. Evert made a motion which was seconded and passed, that a committee be appointed by the President on the deaths occurring in the membership during the past year. Such a committee was submitted by the Chairman, Dr. E. H. Lindstrom.

"We, the Committee on Resolutions, desire to present the following resolutions:

1. "Be it resolved, that the House of Delegates extend to the Park County Medical Association our sincere appreciation for their assistance in making this meeting a successful one and for the efficient manner in which they have contributed towards making this meeting a pleasant and profitable one.

2. "Whereas, during the past year, three prominent and much loved members of our Society, namely: Dr. James E. Stuart of Livingston, Dr. Roscoe Broughton of Laurel and Dr. Frank L. Watkins of Great Falls, have finished their work and have passed into the Great Beyond;

"Be it resolved, that the House of Delegates here assembled, pause to remember their kindness and friendship.

"Be it further resolved, that we remember with gratitude the fact that the practice of medicine in Montana is better and our lives are richer because these men lived and practiced among us.

"Be it further resolved, that there be a permanent record of the lives and work of these men and such a record be made a part of the activities of our Society.

"Be it further resolved, that a copy of these resolutions be spread upon the minutes of this meeting and that another copy be sent to the families of these men."

The following list of names was selected by the House of Delegates to be submitted to the Governor for vacancies occurring on the State Board of Health: Drs. A. Karstad, R. V. Morledge, J. I. Wernham, L. T. Sussex, and F. M. Poindexter.

The following societies constitute societies of the Medical Association of Montana and were grouped as Councilor Districts in the following manner: Northeastern Society, Hill and North Central Societies, Southeastern Society, Yellowstone Valley and Big Horn Societies, Park County and Gallatin County Societies, Fergus County and Musselshell County Societies, Flathead County, Cascade County, Silver Bow County, Mount Power Society, Lewis and Clark County and Western Montana Society.

The last order of business was the election of officers. For President the names of Dr. Harold W. Gregg and J. I. Wernham were submitted. Dr. Harold W. Gregg was elected, President-Elect. For Vice-President the names of Drs. E. S. Murphy and L. Allard were submitted. Dr. E. S. Murphy was elected Vice-President. For Secretary-Treasurer, the names of Drs. T. L. Hawkins, John Doe and Richard Roe were submitted. Dr. T. L. Hawkins was elected. For delegate to the House of Delegates meeting of the American Medical Association, the name of Dr. J. H. Irwin was submitted. Dr. Irwin was elected. For alternate, the name of Dr. E. M. Gans was submitted. Dr. E. M. Gans was elected as alternate delegate. The following councillors were elected: Drs. F. B. Ross, S. A. Cooney, P. E. Kane, and M. B. Hesdorffer.

There being no further business, the House of Delegates adjourned.

THOMAS L. HAWKINS, M.D.,
Secretary-Treasurer.

Strangulated Hernia Reduced En Masse*

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THE REDUCTION en masse of a strangulated hernia is not encountered very frequently and therefore the possibility of such an occurrence is likely to be overlooked. It is very important from a standpoint of treatment to recognize that the tumor mass of an inguinal hernia may disappear and yet the strangulation not be relieved. If this condition is not appreciated and strangulation is not relieved, gangrene of the intestine is certain to follow and death may result.

In an ordinary indirect inguinal hernia, the sac extends down through the internal inguinal ring, through the inguinal canal, external ring, and, depending on its size and extent, more or less into the scrotum. If the intestine, omentum or other abdominal viscus enter and fill the sac, the usual occurrence when reduction of the hernia is accomplished, is for the viscera to return to the abdominal cavity and the sac to remain in place.

In some instances, when a hernia has been incarcerated for a long time and adhesions have occurred between the herniated bowel and the sac, and when strong taxis or pressure is applied to the sac in an attempt at reduction, the sac and all may be displaced within the abdominal cavity; yet the narrowed portion of the neck of the sac at the internal ring may continue to constrict the bowel. This is spoken of as a false reduction or reduction en masse. There are many dangers with an attempt to reduce an incarcerated hernia and this false reduction is one which is often not considered. Another, of course, is injury to the distended and thinned bowel. In many instances this false reduction has been done by the physician (60 per cent in Pearse's¹ cases) and in others by the patient (35 per cent Pearse); in 5 per cent reduction was spontaneous.

Pearse¹ wrote an excellent discussion and resume of the literature in 1931. He states in his article "that this disorder was first described by Saviard who observed in 1693 an operation for strangulated femoral hernia and after the subsequent death of the patient examined the lesion post mortem. Saviard appreciated that the hernia mass had been displaced without relief of the strangulation and published his observations in 1702."

At various intervals since that time, an occasional strangulated hernia which was reduced en masse was recognized and described and arguments occurred as to whether or not this condition really existed. Pearse's study was on a collection of 193 cases collected in the literature from which he excluded two cases of obturator hernias and one umbilical hernia leaving 190 cases. According to his figures, reduction en masse of strangulated hernia is of rare occurrence and was observed in 0.0075 per cent of hernias and 0.3 per cent of those

which are strangulated. This gives an incidence of the accident in one in over 13,000 cases of hernia. His study led him to believe that this accident happens most frequently in middle-aged male subjects who have had a right-sided inguinal hernia for many years. Sixty-four and three tenths per cent were on the right side and 35.7 per cent were on the left. St. John² reported three cases in 1933. Nason and Mixer³ reported five cases in 1935.

Diagnosis

The history is probably the most important single diagnostic factor. There is a usual history of hernia of some years standing and as a rule a truss has been worn. Reduction of the hernia has been accomplished without a great deal of difficulty and may have been held in place by a truss. Ordinarily, when reduction has occurred, the discomfort has been relieved promptly; but the significant thing in the history as far as reduction en masse is concerned, is the continuation of pain in the region of the hernia in spite of apparent reduction. The pain is crampy and colicky and is apt to be followed by nausea and vomiting and signs of intestinal obstruction. As time goes on, there is abdominal distention and inability to get the bowels to move. On examination, an external mass is not seen; but on palpation, firmness and perhaps a diffuse swelling may be felt in the inguinal region.

I would say that if a patient gave a history that he had had a hernia for several years and that when his mass disappeared his discomfort was relieved as a rule, and if he stated that he recently reduced his hernia but continued to have colicky pain, nausea and vomiting and tenderness at the site of the hernia—that these factors would warrant a diagnosis of reduction of strangulated hernia reduced en masse and that operation should be done at once.

Treatment

Immediate operation. Incision should be made over the hernia site and the incision extended upwards if no sac is found. The incarcerated bowel should be freed and inspected and treated as indicated and the usual type of hernial repair done. If the strangulation has continued for a long enough time to cause gangrene of the bowel which will require resection, this, of course, adds a very serious complication.

Report of a Case

The case I wish to report is a white male, 48 years old and a carpenter by occupation. He entered the Minneapolis General Hospital on December 21, 1937, complaining of pain in the lower part of the abdomen, nausea and vomiting and some diarrhea. An inguinal hernia had been present for many years for which he had worn a truss. The hernia would come out but he could always reduce it easily with his hands. Six days before being admitted to the hospital the hernia

* Presented at the Minneapolis Clinical Club meeting, Feb. 10, 1938. From the Surgical Service of Minneapolis General Hospital.
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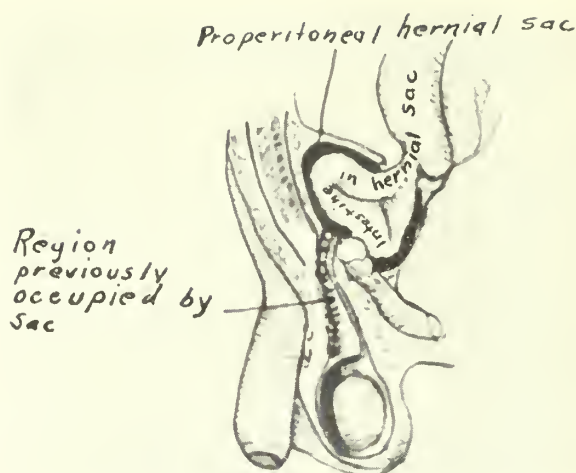


Diagram of Condition Found at Operation.

came out. He reduced it, but he had pain in his abdomen and vomited once; in a few hours he was all right again. On December 20, 1937, about 11:00 P. M., he experienced abdominal pain, and had three loose stools. The pain continued and on the day of admission he vomited about a dozen times before coming to the hospital. The pain was present all of the time but would become more severe every five or ten minutes and he could hear rumbling and gurgling noises when he had this pain. He had lost about twenty pounds in weight in the past four months. There was no history of any change in the bowel habit and no alternating constipation or diarrhea. No blood or other abnormal features were noted in the stools.

Upon examination in the receiving department of the hospital, a small slightly tender mass was found in the left lower quadrant of the abdomen. No mass was present in the inguinal canal or scrotum. On one observation the abdominal mass was said to be about the size of a lemon. It changed in size so that at other times it was considerably smaller. There was no distention of the abdomen. The left inguinal ring was large. He was observed for a while in the receiving department and then admitted to the medical service ward. He continued to have pain in his abdomen and vomiting. A nasal suction tube was put down and he was given extra oral fluids. Surgical consultation was requested.

I saw him in the forenoon of December 22, 1937, and he was still having colicky, crampy abdominal pains distributed throughout the lower part of the abdomen, more on the left than the right. No hernial mass was found in the inguinal region on careful examination. Rectal examination was done. The prostate was very slightly enlarged and soft. No mass could be felt in the abdomen. There was a distinct feeling of resistance and firmness in the left lower quadrant of the abdomen and quite marked tenderness to deep palpation. A suggestion of rebound tenderness when pressure was suddenly released in the right lower quadrant was present. His pain had continued in spite of the nasal suction which was still in place and working properly.

His temperature and pulse were normal. Leucocyte count was 16,050; 82 per cent PMN's; 17 per cent lymphocytes and 1 per cent monocytes. Hemoglobin was 88 per cent. The urine was concentrated, sp. gr. 1036, no albumin and no sugar, an occasional hyaline cast. Sixteen to twenty pus cells were found. Blood pressure was 146/100. General examination was otherwise negative.

A flat plate was made of the abdomen and the findings were not conclusive. There was a suggestion of a collection of gas in the small intestine.

Diagnosis

The diagnosis of incomplete intestinal obstruction seemed quite definite. The possibility of a carcinoma in the lower one-half of the colon or recto-sigmoid was one condition strongly considered and another was an inguinal hernia reduced en masse. Volvulus and intussusception were mentioned.

He was sent to the operating room, the plan being to make an incision over the inguinal region and to look for a sac. If an empty sac was found, the exploration would need to be carried on further to determine the cause of the obstruction. If no sac was found, we could be quite certain that a reduction en masse had occurred inasmuch as there was a definite history of a previous large left inguinal hernia. The usual incision was made over the inguinal canal. No sac was found on careful search at the usual site. The incision was then extended upwards and a dense, dark blue mass could be seen and felt and it appeared to be peritoneum containing incarcerated bowel. The sac was opened carefully and blood-tinged serous fluid such as is found in the sac of a strangulated hernia escaped. On further opening the sac, dark colored small intestine was encountered and there was a definite constriction of the sac at the upper end. When this constriction was divided, the intestine was easily freed and carefully examined; it appeared to be viable, and was returned to the abdominal cavity. It was then definitely established that this sac occupied a properitoneal position, that is, it lay between the peritoneum and fascia of the transversalis muscle.

The sac was closed by a modified purse string in the internal ring, the sac divided and the stump anchored under the internal oblique muscle. The usual type of closure was made suturing the internal oblique muscle and conjoined tendon to the shelving portion of Poupart's ligament, using chromic catgut. The fascia of the external oblique was also imbricated behind the cord and the skin closed with dermal.

The day following operation, the patient's temperature rose to 102. It subsided promptly and he made an uneventful recovery, the wound healing by primary intention. He left the hospital on January 5, 1938, fifteen days after his admission to the hospital and fourteen days after operation.

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Bronchoscopy as an Aid to the General Practitioner

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IN THE PROGRESS of medicine during the past twenty years, many new subjects have been added. In laryngoscopy, bronchoscopy has matured until in many hospitals it has become a separate department. At first used only for the recovery of foreign bodies aspirated or swallowed, it has now become a standard procedure in diagnosis and treatment.

I feel it might be worth while to the general practitioner to discuss briefly bronchoscopy and esophagoscopy, when indicated, when contraindicated, its range of usefulness in diagnosis and treatment of disease.

Bronchoscopy is indicated for the following:

1. *Removal of foreign bodies.* Here many cases inaccurately diagnosed as asthma, tuberculosis, and malignancy have proven to be aspirated foreign bodies which have become lodged in the lung. Many of these have remained here for months and even years. Objects such as peanuts, seeds, and those capable of producing arachidic acid are usually rapid trouble makers and should be removed as soon as possible. Contrary to usual belief, in Jackson's Clinic only 2 per cent of their work is the removal of foreign bodies.

The indications for bronchoscopy for a foreign body as outlined by Jackson are as follows:

- a. The appearance in the roentgenogram of a foreign body or any suspicious shadow.
- b. Cases in which a clear history is given of the patient's having choked on a foreign body and the latter never found.
- c. Cases in which there are signs of stenosis of the trachea or the bronchus.
- d. Any case suspected of being bronchiectasis, to exclude the possibility of a foreign body.
- e. In the absence of any history of a foreign body, the patient giving symptoms of pulmonary tuberculosis without finding of bacilli in the sputum, and especially if the physical signs are at the right base; above all, if there are signs of pleural effusion.
- f. In case of doubt.
- g. If the presence of a foreign body has once been definitely established, there is only one treatment—bronchoscopy.

Foreign bodies of dental origin in the lungs are most important. They include foreign bodies of the following types: teeth, dental burrs, gold crowns, dental plates, fillings, parts of dental instruments, portions of plaster-of-paris casts, hard rubber from dental mouth gags, discs for dental cement and nerve canal reamers. The favorite site of lodgment of foreign bodies is in the right main stem bronchus, the ratio being approximately two to one. The majority of these accidents occur while the patient is under an anesthetic. Swallowing of dental protheses accidentally during eating is very common. Foreign

bodies of dental origin produce symptoms similar to those arising from other inorganic objects. The train of symptoms to be expected are cough, pain in the chest, hemoptysis and dyspnea. These may be the only symptoms produced for years while, on the other hand, a lung abscess may develop within a very short time.

2. *Postoperative atelectasis.* Here, following operation the bronchi become filled with a thick gelatinous secretion and at first contain no pus. Later this becomes purulent and a drowned lung with purulent bronchitis results, finally resolving into a lung abscess or bronchiectasis. When this occurs, aspiration should be done immediately; it usually gives prompt relief, restores the lost aeration and recovery is uneventful.

3. *Bronchiectasis.* Bronchoscopy is used here not as a curative measure but for the relief it gives. It is not uncommon to have a patient come in and request bronchial suction because of the comfort it affords.

4. *Acute or chronic pulmonary abscess communicating with the bronchus.* Removal of the pus, crusts, and granulation tissue favors drainage. Combined with postural drainage and general health measures, bronchoscopy gives excellent results. Usually, however, this has to be repeated several times as one aspiration is not sufficient. Clerf advocates and obtains cures in 70 per cent of his cases of lung abscesses by bi-weekly aspirations plus complete bed rest and a high caloric diet. This is combined with postural drainage four times a day and the use of neoarsphenamine if spirochetes are found in the aspirated pus. He obtains these results where treatment is instituted within three months of onset.

5. *Bronchial obstruction.* This includes the non-opaque foreign body, a benign growth in the lumen, or enlarged lymph nodes or traction due to fibrous tissue.

6. *Cases of unexplained cough persisting over a period of a month.* Dixon reports a case of a patient whose cough persisted despite treatment for three months. On auscultation the lung revealed the presence of persistent râles. On bronchoscopy the bronchi were found to be red and velvety. Suction was used and the red areas were touched with silver nitrate. Following this, the patient became much more comfortable, the cough soon disappeared and the lung rapidly returned to normal.

7. *Unexplained dyspnea.* Bronchoscopy is sometimes used here as an aid to diagnosis. However, it is not indicated in the dyspnea of angio-neurotic edema of the larynx; instrumentation aggravates this condition.

8. Bronchoscopy is useful in the removal of diphtheritic membrane from the trachea and is often life-saving.

9. Lastly, bronchoscopic removal of tissue for biopsy gives much information and often helps in the prognosis and treatment.

Bronchoscopy is contraindicated in serious organic disease such as: aneurism, hypertension, advanced cardiac disease, acute alcoholism, acute respiratory infections and severe hemoptysis. Artificial pneumothorax and phrenicectomy are not exactly contraindications. The diabetic should be under insulin treatment. The syphilitic should receive anti-luetic therapy before any work is done. Jackson, however, recognizes no absolute contraindications to bronchoscopy.

Esophagoscopy is indicated in:

1. *The removal of foreign bodies.* The contraindications in such cases are usually practically nil. One point I wish to stress is that these cases are usually not emergency removals, but can wait until the stomach has been emptied. This makes for greater ease in working as the operator is not troubled with emesis. Food should be withheld for at least five hours before the esophagoscopy.

2. *Confirming the diagnosis of malignancy.* Esophagoscopy gives us biopsy material. This is usually a safe, quick procedure and is attended with little discomfort. I was rather surprised, in going over the records in one of our larger hospitals, to find that most of the obstructions in the esophagus were diagnosed cancer by the X-ray alone, and not confirmed by biopsy. However, negative results do not mean freedom from cancer. In those cases where biopsy shows malignancy, radium may be implanted directly into the growth through the esophagoscope.

3. *Preventriculosis or cardiospasm.*

4. *The swallowing of any caustic.* Here it is best to begin the dilatation as soon as the wall of the esophagus will withstand instrumentation. This, of course, will depend on the severity of the burn, and will probably be from two to three weeks. If the patient is allowed to go until food no longer passes through, then the scar tissue has become so firmly organized that dilatation is long and difficult. This is often only possible by retrograde dilatation.

Esophagoscopy is contraindicated in much the same types of cases as in bronchoscopy: in the extremely ill, in cases of aneurism, hypertension, advanced organic disease, extensive esophageal varicosities; acute necrotic or corrosive esophagitis until sloughing has ceased and healing has strengthened the weak places. In the dehydrated patients, esophagoscopy should be deferred until water is supplied; in acidosis, until this is corrected.

As to the cause of our failures—well, the only fellow who has never failed is the one who has never tried. Bronchoscopy differs from all other nose and throat operations in that it is the only one where team work is essential. Kipling might have been speaking of bronchoscopy when he wrote:

"It ain't the individual
Or the army as a whole,
But it's the everlastin' team work
Of every bloomin' soul."

In the general hospital, an ever-changing group of nurses and internes makes team work almost impossible. Most often the assistants have never been present at a similar operation and their part has to be explained to them pre-operatively. After the operation, their breaks in technique are explained to them so that it will not recur; but at the next bronchoscopy a new group is usually present. Most of these cases are charity cases and instruments are expensive. Usually one never gets the money he invests in these instruments returned, so that in most general hospitals, no instruments are provided. However, as the members of the staff and the general practitioners become more alert to this work and demand it, I feel sure this will be corrected.

We sometimes fail to recover foreign bodies because of the infrequent number of cases and the difficulty in working through a tube the size of a lead pencil, two feet long, the lumen of which is half filled with a grasping forceps.

Again we fail to recover biopsy material in suspected cancer cases, because on examination we find the lumen is compressed but smooth and there is no material to remove. Cracovaner in a report of 49 esophagoscopies at the Lennox Hill Hospital, New York City, found 41 cases yielded carcinoma on the first operation. However, 8, or 20 per cent, had to be re-scoped on the average of four times and of these 8, five later yielded carcinomatous material after repeated esophagoscopies.

Conclusions

1. It can be said with certainty, "If a foreign body is aspirated into the bronchi and allowed to remain there, abscess formation will likely follow in the majority of cases."

2. In every operation about the mouth and when giving patients an anesthetic, care should be exercised to prevent aspiration infection.

3. Symptoms in most cases following the aspiration of foreign bodies are immediate, namely, cough, pain in the chest and hemoptysis. Later symptoms may simulate tuberculosis. Many cases of foreign bodies in the lungs are often previously diagnosed as tuberculosis. Tuberculosis may, however, co-exist with lung abscess.

4. Bronchoscopy is indicated in any case as a diagnostic measure if the history and X-rays are not conclusive.

5. When the presence of a foreign body has been definitely established, there is only one treatment—bronchoscopy.

6. Death is due in most cases to lung abscess, bronchiectasis, and gangrene.

7. Bronchoscopy offers a most helpful aid in diagnosis and treatment in the field of medicine.

8. This writer feels that the general practitioner may, in many cases, gain much by consulting with the endoscopist in regard to various problems of diagnosis and treatment.

The Student Health Problem of Appendicitis

A Report of 1303 Cases at Student Infirmary and Wisconsin General Hospital

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Frederick G. Joachim, M.D.^{††}

Madison, Wisconsin

APPENDICITIS has long been one of the most disconcerting problems of medicine. The disarming simplicity of this common abdominal condition has always confounded the medical profession with the incongruity of its surprising mortality rate. In spite of the industrious and conscientious efforts of physicians everywhere, the annual loss of lives from this condition has persistently increased. Particularly distressing is the death of 20,000 Americans from appendicitis each year, because the United States tolerates a death rate which exceeds that of any other civilized country.

The dissatisfaction of the medical profession with its own alarming inadequacy in the management of appendicitis is frankly manifested by the prolific way in which it pens numerous articles on the subject; in the Quarterly Index for 1936 alone one may count 500 such papers. Obviously, a review of the literature for even a few years is such a ponderous and unwieldy task that authorities have endeavored to rescue the subject from its literary chaos by reducing the diagnosis and treatment to a few simple dogmata. The efficacy of these teachings has been reflected in the gradual but gratifying decrease in the mortality rate under desirable conditions in many institutions.

In the experience of the Student Health Department at the University of Wisconsin, three well recognized factors have seemed to define the narrow margin between success and failure in the treatment of acute appendicitis; they are: (1) age, (2) duration of illness, (3) self-medication. In a student health practice these factors are optimum.

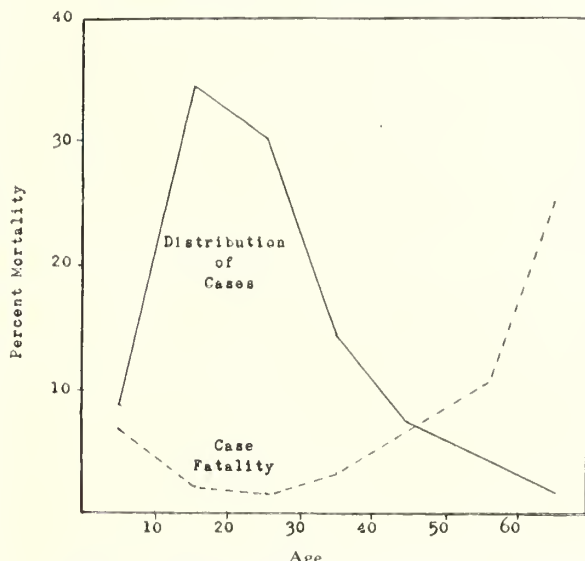
The patients are healthy, intelligent, young adults who come to the infirmary for treatment within a few hours after the onset of their symptoms and have, therefore, only rarely resorted to self-medication. To illustrate the importance of this desirable fact, a series of cases from the Student Infirmary will be presented. The indisputable advantage of treating a selected group of young adults under desirable conditions is manifest in the fact that the mortality for 615 consecutive admissions to the University Infirmary for appendicitis has been zero.

Uniformly good results in the management of the appendicitis problem are reported by student health departments elsewhere.¹ In a collective group of 706 cases from five universities, only three deaths have been attributed to appendicitis.²

The study is concerned with the period between 1926 and 1937. The average age of the subjects, 20 years, represents the peak of the morbidity curve but, more

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^{††} Assistant physician, department of student health, University of Wisconsin.

FIGURE 1
Mortality by Age Groups (Dauer and Lilly)



(90% of the student patients are in age group 18-22 years).

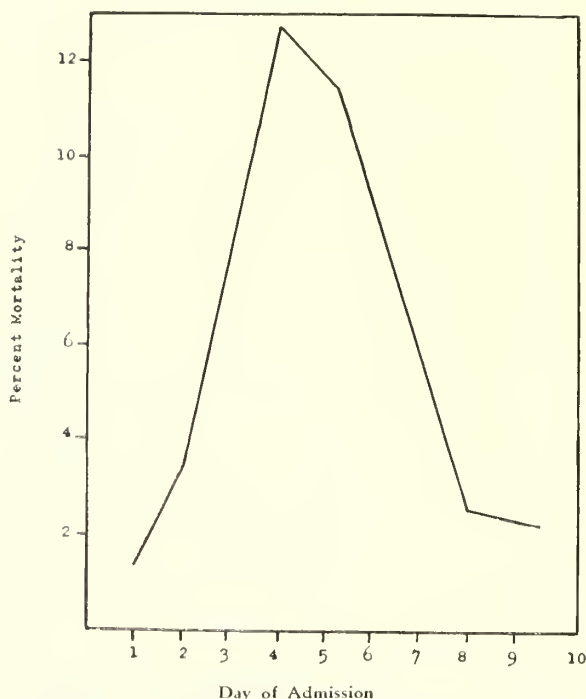
significantly, it also falls at the low point in the mortality curve for appendicitis.³ Ninety per cent of the group were between the ages of 18 years and 22 years. Figure 1.

The desirability of early hospitalization and treatment in acute appendicitis has been stressed frequently. Figure two⁴ shows the importance of prompt care and the danger that accelerates so rapidly with delay. Advantageously, 75 per cent of the patients are seen at the infirmary before their symptoms are 24 hours old; treatment has been instituted in almost 50 per cent of the patients within 12 hours after the onset of illness.

A logical corollary is the fact that self-medication with cathartics and saline purges occurred so infrequently in students as to be practically negligible. Schmidt and Taylor⁵ have observed in an earlier survey that perforation is twice as frequent in the group of patients who have taken a cathartic. The culpability for this complication probably does not lie with self-medication *per se*, but with the dangerous delay that fosters it.

The advantage of early hospitalization is again attested by the unusual freedom from complications. The appendix was ruptured in only 12 cases. The perforation was believed to have existed on admission in four of these, and to be due to procrastination in operating because of confused diagnosis or valid interdiction of surgery in the remaining cases. Half of the individuals with this complication was subjected to operation and

FIGURE 2
Mortality and Day of Surgery (Stanton)



(71% of the patients enter the Student Infirmary within 24 hours after the onset of symptoms).

surgical drainage, whereas the other half was treated conservatively. In every instance except one, the peritonitis was well localized or had proceeded to abscess formation. The one circumstance of general peritonitis responded well to conservative therapy.

It is extraordinary that such unavoidable and unpredictable accidents as embolism, massive atelectasis, or postoperative pneumonia, have never caused a single fatality. In the history of the Student Health Department, no death from appendicitis or its complications has ever occurred.

Since 1924, Schmidt, Gale *et al*⁶ have treated 1303 cases of acute appendicitis. Approximately half of the number (688) has been these cases in the Student Health Department. The other half has been from the Wisconsin General Hospital proper, adjacent to and in connection with which the Infirmary is operated. Since the very important factor of personnel is identical for both groups of patients, an interesting study can be made of general practice compared with student health practice in acute appendicitis.

Whereas the student patients can be included in a narrow age bracket from 18 to 21 years, 33 per cent of the Wisconsin General Hospital patients were under 10 years or over 30 years, in those age groups generally conceded to suffer the highest mortality in acute appendicitis. Only 45 per cent of the Wisconsin General Hospital cases were admitted on the first day of their

illness, as contrasted to 75 per cent in the Student Infirmary. Moreover, 20 per cent of the former series had resorted to catharsis prior to admission.

Most important is the occurrence of ruptured appendix in 19 per cent of the General Hospital cases as opposed to the rarity of only two per cent in the Student Infirmary. It must be remembered that the mortality is 25 per cent in ruptured appendicitis, and the striking significance of this one discrepancy between the two groups is obvious.

The gross mortality of the General Hospital group is 5.68 per cent, which compares very closely with the mortality that Stanton⁴ found in a collective study of 16,024 cases (5.5 per cent).

In a summary consideration, one notes that the chief differences between the Student Infirmary series and that of the Wisconsin General Hospital occur in the factors of age and duration of illness, with self-medication and ruptured appendix depending on the latter factor. It seems that the hope for the future in the problem of appendicitis must depend on a relentless effort to bring the patient to his physician more promptly.

Conclusions

1. In a survey of 1303 consecutive cases of acute appendicitis, success in treatment seems to depend simply on the age of the patient, the duration of his illness and the matter of self-medication.
2. The conditions attending the treatment of acute appendicitis in a student health practice are optimum.
3. There have been 615 consecutive cases of acute appendicitis treated at the Student Infirmary since 1926, with a mortality of zero.

COMPARISON OF PERTINENT FACTORS IN THE WISCONSIN GENERAL HOSPITAL GROUP AND IN THE STUDENT INFIRMARY

	Wis. Gen. Hosp.	Student Infirmary
Number of cases of acute appendicitis	688	615
Age of patients	30% under 10 yrs. or over 30	90% between 18 yrs. and 22 yrs.
Duration of illness (per cent admitted on first day of symptoms)	45%	75%
Self-medication	20%	Negligible
Ruptured appendix	19%	2%
Mortality:		
Uncomplicated cases	1.9%	
Ruptured appendix	20.0%	
Gross mortality	5.68%	0%

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6. Department of Surgery, University of Wisconsin Medical School.

Dry Eyes

The Effect of Deficient Lacrimation

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A CONSTANT flow of tears over the surface of the eye keeps it lubricated and clean and moist. The tears, acting as a lubricant, permit the smooth and easy movement of the lids over the eye. Acting as a cleansing agent they wash foreign particles off its surface. They are also necessary for the health of the epithelium of the conjunctiva and cornea.

The tears are secreted by the lacrimal gland, which lies in the upper outer corner of the orbit. Poured into the upper part of the conjunctival sac, they flow within it over the eyeball, downward and inward toward the nose. At the upper fornix is the lacrimal gland proper; near it, and also in the lower fornix, are small accessory lacrimal glands, and scattered over the conjunctiva are others still smaller and of both serous and mucous types. The fluid found in the normal conjunctival sac consists of secretion of the lacrimal gland mixed with that of numerous small glands of the conjunctiva. It flows in a thin layer across the surface of the eye and collects at the inner canthus in the lacrimal lake. Here a drop accumulates which drains by way of small ducts into the cavity of the nose.

Within the extreme nasal portion of both upper and lower lids is a small tube, the canaliculus, which opens on the margin of the lid as a punctum. The two canaliculi carry tears from the lacrimal lake to the tear sac, whence they flow directly downward to enter the nasal cavity under the inferior turbinate. The fluid flows through the canaliculi partly as a result of capillary attraction and partly because of suction produced in the lacrimal sac. A bundle of the orbicularis muscle of the lids is attached to the inner canthal ligament and to tissue on the anterior surface of the sac. When the lids are closed, this bundle contracts, pulling forward the wall of the sac and creating a partial vacuum within it. Valves in the lining membrane at the lower end of the sac in the nasolacrimal duct prevent fluid from the nose being drawn up into it.

The amount of tears formed in a day is difficult to determine and, consequently, estimates vary considerably, ranging from 0.5 to 6.6 cc. It is probable that about 3 or 4 cc. is secreted in twenty-four hours, most of it during waking hours. Perhaps half of this is lost by evaporation on the surface of the eye. The rest flows into the nose where it is picked up by the air passing by during breathing.

Lack of tears leads to dryness of the eyes and to a condition variously described as keratitis sicca, keratoconjunctivitis sicca or filamentary keratitis. The symptoms it produces are stickiness of the lids, burning and painful sensations, often most intense on awakening or on use of the eyes. These persist for many years, some-

times with slight remissions. There is little or no impairment of visual acuity. The clinical picture consists of a mild congestion of the bulbar conjunctiva, threads of mucus in the lower cul-de-sac and epithelial filaments attached to the surface of the cornea. Fluorescein in 1 per cent aqueous solution stains the cornea in punctate areas, which usually are so small that they are visible only with the aid of a magnifying glass and good illumination. They are seen best with the slitlamp. The disease most often, but not always, affects women who are past the menopause and who have chronic arthritis. The cause is an inadequate secretion of tears following surgical extirpation of the gland, its destruction by infection, or interruption of its nerve supply. The most satisfactory treatment available was proposed by Beetham,¹ of Boston, in a thesis presented to the American Ophthalmological Society in 1935. He closed the lacrimal canaliculi by electric coagulation in order to retain in the conjunctival sac all available secretion. I have found that after closure of the canaliculi, instillation of a solution of artificial tears adds further to the comfort of the patients.

My own interest in the effect of a lack of tears and in the manufacture of artificial tears came through a study last spring and summer of a girl who had an obscure disease of the eyes. This case has been reported elsewhere.²

Report of Cases

Case 1. A girl, aged seventeen years, came to The Mayo Clinic in April, 1935, because of pain and a sensation of scratching in her eyes. These symptoms had been present for three years in the left eye and three months in the right eye. Six months before the onset of these symptoms, swelling of the left side of her face had occurred; this had lasted about two weeks and had recurred several times during the next few months. The patient said that during that period she had been quarantined four times for mumps. Then the left eyelids had become swollen for a week. Thereafter painful swelling had recurred almost every month; this had lasted from one to two weeks and had involved the right or left side of the face or the left eyelids. On a few occasions the submaxillary regions had been swollen. The patient could not recall that fever had accompanied the swelling. Other parts of the body had not been involved. Apparently, chronic infection of the salivary and lacrimal glands had been present.

Examination of the eyes in April, 1935, revealed the presence of filamentary keratitis. In the lower cul-de-sac were threads of mucus, and attached to the cornea were strands of epithelium 2 to 6 mm. in length. Fluorescein stained the cornea in discrete and confluent punctate areas. These signs and the intensity of the symptoms varied from week to week, but the picture remained

* Part of a paper read before the meeting of the South Dakota State Medical Association at Huron, South Dakota, May 10, 1938.
† Section on ophthalmology, the Mayo Clinic.

essentially unchanged during the next two years. During this period of 1935 and 1936 carotene in oil was instilled three times a day; this gave the patient partial relief and kept her more comfortable than she had been for several years.

She returned in April, 1937, and said that, while her eyes had been comfortable part of the time, reading and watching movies had caused pain, and that after sleeping her lids always had been sticky and her eyes had been irritable. She wished for further relief beyond that produced by the carotene in oil. A recheck of her general condition revealed nothing significant except that the amount of salivary secretion was diminished. In looking for a possible disturbance in the nutrition of the corneal epithelium, I found the flow of tears greatly below normal.

This can be measured in a number of ways, but most simply by a method suggested by Schirmer³ in 1903. Ordinary filter paper is cut into strips 5 mm. wide and 25 mm. long; one end of a strip is bent and placed in the conjunctival sac behind the lower lid and over the lower punctum. After five minutes it is removed and the moistened part of the strip measured. Normally 10 to 15 mm. of the paper will be moistened. In eyes with no lacrimal secretion, 2 to 3 mm. of the paper will be moistened, for that amount lies directly against the mucous membrane of the conjunctiva. In this case the readings varied between 4 and 5 mm.

To supplement her deficient flow of tears I had the patient instill in her left eye every hour for several days a solution resembling normal tears in composition, consisting of Locke's solution to which was added enough of her own blood serum to make a 10 per cent solution of the serum. The right eye served as a control and no drops were used in it. The patient said that the drops were soothing for a few minutes but the effect was too transient. Various means were tried for temporarily blocking her canaliculi to keep the drops in the conjunctival sac, but they all failed. Silk sutures placed through the upper and lower left eyelids around the canaliculi were effective for six days and then sloughed out, leaving a wedge-shaped defect in the nasal portion of both the lids and cutting through the canaliculi. During the time the canaliculi were closed, the left cornea healed while the right cornea, which was serving as a control, remained unchanged. Encouraged by this temporarily favorable result, Dr. Benedict sealed the upper and lower canaliculi of the left eyelids with an electric coagulation needle. Within two days the eye was greatly improved, but remained entirely free from punctate ulcers and filaments only when artificial tears were instilled three times a day. During the next six weeks the left eye remained entirely comfortable and at no time showed more than two or three punctate ulcers while the right eye, which served as a control, continued to have filaments and usually twenty to sixty small ulcers. Then the right canaliculi were sealed with the electric coagulation needle. The next day there were no filaments or ulcers. There must have been a slight lacrimal secretion on this side as instillation of artificial

tears was not necessary except in the morning on awakening. The patient returned to school and has been entirely comfortable for eight months; she has been using the drops three times a day in the left eye and once in the morning in the right.

When I asked my associates to look out for similar cases for me, we found a number of them. The histories of three of these cases illustrate rather well our further experience in treating dry eyes.

Case 2. A housewife, aged sixty years, was seen June 3, 1937. She had had chronic infectious arthritis in various joints, during a period of ten years, chiefly in her wrists and knees. Her eyes had been uncomfortable for three years and had burned whenever she had been tired or had tried to read or sew. In August, 1935, she had lost her husband and had cried frequently but had not shed any tears. She had had the same experience in December, 1936, when she had lost a daughter. Both corneas were slightly hazy, and when they were stained with fluorescein examination with the slitlamp revealed innumerable tiny ulcers. There were no filaments. The flow of tears was not measured, but it was obviously diminished. (At this time I did not know of Schirmer's test nor of Beetham's work.) On June 7, under procain anesthesia, a cherry red cautery was inserted into the lower punctum on the right side and the lining membrane of the canaliculus was seared. A few days later the right cornea was practically normal. However, a week later it was the same as ever and the punctum and canaliculus were wide open. It was thought that scar from the cauterization ought to close it later, and on June 18 the left lower punctum and canaliculus were seared with a cherry red cautery. For a few days the left cornea healed and the eye became comfortable; then, as the reaction in the lids subsided, the punctum opened wide and the cornea once again became dotted with tiny ulcers. The patient returned to her home in Dakota before anything further could be done, and she was miserable all winter. Recently, she came back to have her tear ducts closed permanently and my associate, Dr. Bair, sealed them by electrocoagulation. Now when she instills artificial tear solution several times a day she is comfortable.

One would expect that an actual cautery would produce enough scarring to close a canaliculus, but it does not do so. Beetham, I learned later, had the same experience. To close the canaliculi permanently, it is necessary either to dissect them away or to seal them with an electric coagulation needle.

Case 3. A woman, aged fifty years, was seen August 16, 1937. She had had chronic infectious arthritis for three years. Her eyes had been uncomfortable for two years and had been most uncomfortable after reading. She had cried frequently because her eyes had been so miserable and she always had seemed to feel better after a good cry, although she had not shed any tears. Her corneas presented the typical picture of filamentary keratitis. Strips of filter paper placed in the lower cul-de-sacs for five minutes, according to the method of Schirmer, were moistened only for a distance of 4 to 5 mm., whereas

in normal eyes the paper is moistened at least a distance of 10 mm. Instillation of artificial tears produced partial relief. Since the patient could not remain at the clinic long enough to have her canaliculi closed by electric coagulation, I wrote to the oculist who had referred her to us and suggested he do it himself. He did, and wrote a few weeks later that "the patient's eyes were absolutely comfortable, looked moist."

In this case there was enough secretion to moisten the eyes once the drainage channels were closed, and supplementary artificial tears were not required.

Case 4. A woman, aged sixty-two years, was seen by me on November 4, 1937. She had had chronic infectious arthritis seventeen years previously and for several years after that, but there had not been any recent flare-ups. Since 1931, she had had a chronic, persistent, low-grade conjunctivitis for which she had been under treatment at the clinic at various times. Since 1934, her eyes had been irritable every night. After she had retired she had been able to get her lids open only with the aid of her fingers for they had seemed to stick to her eyeballs. After her morning bath she had been rather comfortable. In 1936, infection in both tear sacs had closed the left nasolacrimal duct and had necessitated the extirpation of the right lacrimal sac. This patient then had no open tear ducts, yet when I saw her last November she had filamentary keratitis, tiny punctate ulcers on both corneas and epithelial filaments on the left. The eyes looked dry and Schirmer's test revealed that the strips of filter paper were moistened

only a distance of 2 mm. There was no lacrimal fluid and the long-standing infection of the conjunctiva had made it dry and scarred. The instillation of artificial tear solution four to six times a day made her eyes more comfortable than they had been for several years and caused the disappearance of the filamentary keratitis.

In this case, in spite of the closed nasolacrimal ducts, complete absence of tears produced filamentary keratitis.

Once the drainage channels are blocked there may be enough natural secretion to keep the cornea moist and permit its epithelium to heal. In some cases there is no lacrimal secretion, and then it becomes necessary to supply substitute tears.

The most effective substitute I have been able to find is one which resembles tears in composition. This consists of a mixture of one part of human blood serum in nine parts of Locke's solution. The serum protein lowers the surface tension of the solution, causing it to adhere to the cornea and spread over its surface in a thin film. A moist covering film is necessary for the health of the corneal epithelium, and its preservation is the objective in treating dry eyes.

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The Use of the Fluoroscope In Examination of College Students

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IT WAS Sir James Mackenzie who said that multiplying instruments of precision multiplies one's opportunities for making mistakes, and this generalization may apply as well to the fluoroscope as it did to the clinical polygraph. To use our diagnostic armamentarium with discrimination and judgment requires an intimate knowledge of it which, unfortunately, cannot be obtained without some sobering experiences. To discount the value of information obtained by an interesting and striking method is at times difficult, especially when that method so often affords invaluable aid.

Since the toll from pulmonary tuberculosis is highest between the ages of 18 and 35, the problem is one of perennial interest to those engaged in work with college students and the present discussion is limited to that aspect of the usefulness of the fluoroscope, although it frequently contributes to one's knowledge of other chest conditions such as size and contour of the heart and

great vessels, intra-thoracic tumors, progress of resolution in pneumonia and expansion of a lung which has suffered a spontaneous pneumothorax.

Although "opinion has bubbled freely from the wells of thought" on the subject of the relative merits of tuberculin testing, X-raying, and fluoroscoping young adults, there is not an abundance of statistical material which can be marshaled in defense of any one procedure. The investigation of Bloch and Francis led them to believe that the tuberculin testing method did not equal the fluoroscopic method in reliability or efficiency, that, because of the high incidence of positive tuberculin reactions in most adult groups in industrial and urban communities, a very high percentage of tested individuals required X-rays. Hetherington found that when the cost of films is important, fluoroscopy is a more efficient screen than tuberculin testing, i. e., a higher proportion of those selected for films will have significant lesions. Amberson recommends the tuberculin test

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Year	Number Examined	Number of Cases	Number Hospitalized	Average Age	Family History	Past History	Number With Symptoms	Incidence	Diagnosed by Fluoroscopy	Incidence
1927	2390	7	1	32 years 6 months	2	2	2	.28%		.37%
1928	2464	6	3	28 years 8 months	1	1	6	.35%		
1929	2654	12	6	28 years 11 months	3	2	11	.45%		
1930	2911	13	5	29 years 2 months	4	2	12	.44%		
1931	2488	11	8	23 years 2 months	2	5	11	.44%		
1932	2296	10	8	26 years 6 months	3	4	8	.43%		
1933	2561	6	3	30 years 4 months	3	2	5	.23%		.44%
1934	2803	13	4	28 years 2 months	5	4	9	.46%	6	
1935	2737	15	6	26 years	5	3	4	.54%	8	
1936	2738	9	3	27 years 4 months	4	1	7	.32%	4	

TABLE—Results of physical examinations of the student body, University of Chicago, 1927 to 1936, inclusive. Use of the fluoroscope was not initiated until start of 1934. Demonstrating incidence of pulmonary tuberculosis as diagnosed without (1927-1933) fluoroscope; and with (1934-1936) fluoroscope.

as screen if the community is known to have a low incidence of infection—X-rays if the incidence is high.

The failure of fluoroscopic diagnosis has been estimated from three to thirty-three per cent, depending upon the experience of the examiner, and it is of course true that X-ray is superior to fluoroscopic examination; but when large groups are to be examined expense makes this procedure impracticable.

In 1927, which marks the beginning of the period covered by our statistics, physical examination was required of all entering undergraduates, and was optional for graduates. Since 1930 examination has been required of all entering students excepting summer school graduates.

In 1934, fluoroscopic examination of the chest was required of all our entering students in addition to the routine physical examination. The accompanying chart indicates our findings between 1927 and 1937. For the seven-year period prior to the use of the fluoroscope, our incidence of pulmonary tuberculosis, calculated upon 17,764 examinations, was .37 per cent, whereas the percentage in the past three years, calculated upon 8,278 examinations, was .44 per cent. The average age of discovered cases before fluoroscopic examination was 28 years and two months; the average age subsequent to fluoroscopic examination was 27 years and four months.

Although these figures are not sufficiently striking to offer conclusive proof that our case-finding has been materially improved, or that cases are found appreciably earlier than before, the large number of cases examined leads us to believe that such is the case. (The depression, the New Deal or even Mr. Hutchins' new plan may have exerted a subtle influence upon our body scholastic which is not susceptible of evaluation by other than the philosophic method).

The fallacy of relying upon any examination as permanent security against open pulmonary tuberculosis in a student body has been amply and repeatedly demonstrated in our student body. We do not believe that a population with negative chest X-rays in September will be entirely negative by X-ray examination the following June, because significant and advanced pathology may appear in a surprisingly short time.

Our experience leads us to believe that tuberculosis occurs most frequently among Oriental students, medical students and those with a positive family or contact history, and it would seem to us to be a long stride forward in preventive medicine if pulmonary tuberculosis were to be considered an infectious disease as communicable as diphtheria, and if contacts were studied as carefully for evidence of infection as a contact with diphtheria.

Convulsions in Infancy and Early Childhood*

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CONVULSIONS constitute symptoms and not disease. They vary widely in severity depending upon the spasmogenic susceptibility of the individual, the potential force of the exciting cause, and conditions favoring reflex irritability. The term "convulsions" is employed in a broad sense to designate any tonic or clonic spasm, with or without loss of consciousness. In this paper, I shall limit discussion mostly to attacks of general convulsions with loss of consciousness, which in the majority of cases are functional disturbances.

Convulsions, local and general, arise from excessive and irregular discharges of nerve-centers in the base of the brain. Nothnagel suggests the presence of a convulsive center in the pons. The central gray matter is the source of spasmogenic impulses.

In infants the nervous system is structurally immature. At birth the inhibitory control of cerebral nerve cells is limited to a great degree, and with the increased irritability of the lower centers readily allows convulsions to develop. In the earlier months of life eclampsia is common, progressively less so after birth to the first year, and rarer after the second year.

Etiology

The frequency of convulsions is great. In the mortality statistics, it stands well toward the head of the list among the causes of death in infants under two years of age. It is unusual for a healthy child to suffer from convulsions unless the exciting cause be overwhelming, such as trauma, an intense irritant or poison. They readily occur in children of unstable nervous equilibrium, as occurs in spasmophilia. This condition may be inherited or acquired and is of varying degree. One convulsion predisposes to another and the habit may become fixed.

Of the determining causes, by far the most important is the use of improper food, unsuited in amount, kind, or condition to the needs of the child. Milk from a mother or wet nurse may be vitiated by fatigue, emotions and excessive alcoholic indulgence. Disturbed dentition and intestinal parasites, through reflex nervous irritation may cause eclamptic attacks. Other causes are whooping cough, pneumonia, the exanthemata, syphilis, ptomaine toxemia, uremia, diabetes, tetanus, malaria, heat, cold, febrile states, burns, fatigue, blood loss, shock, emotional disturbances, as fright and anger, and poisons such as lead, strychnine, and alcohol. Some interesting cases of convulsions were reported by D. D. Stewart in children poisoned by lead used as coloring matter in candies. Meunier reports eclampsia in nursing infants where the nurse took large amounts of alcohol. Many of these causes are aggravated by meteorological conditions, espe-

cially excessive summer heat. Convulsions due to cerebral diseases such as hemorrhage, external pressure from a rapidly increasing hydrocephalus or abscess, embolus and thrombosis, are most serious. Rickets does not usually cause general convulsions; the disorders resulting from this condition are more likely to be tetany and laryngospasm.

Prognosis

In estimating the dangers resulting from convulsions, it is necessary to consider the cause, age of the child, frequency and persistency of the attacks. Convulsions of the new born are often fatal and may leave the child mentally deficient. In a large majority of cases, eclampsia is not fatal; however, in the early months of life the death rate is high. Convulsions due to intra-cranial disease are of serious import. Fits appearing as prodromes of acute febrile conditions are rarely serious and may not indicate an unusually severe attack of the disease. When they occur after the establishment of the characteristic features of the disease, they are of greater significance, and may indicate the onset of nephritis, meningitis, middle-ear disease, or other grave complications. The points on which one may base a serious prognosis are extreme prolongation or frequent recurrence of the convulsions; also profound disturbances of the circulation, stupor or prostration.

Gossage and Coutts lay great stress on the fact that the dangers of neurotic manifestations in future life have been under-estimated. As early as 1899 the British Medical Association produced statistics showing that over one-half of the patients who had exhibited convulsions in infancy suffered from some form of neurosis in later life. This was particularly true in children born of gouty, nervous or diabetic parents.

Symptoms

Attacks of eclampsia vary. They may be general or partial. Immediately before the convulsion the child may cry out. There is often pallor, fixation of the eyes, or they may be rolled up into the orbits. Such slight isolated movements may develop into convulsive twitchings, extending rapidly over the entire body or shifting from one side to another, or from one limb to the opposite, with retraction of the head and arching of the body. The hands may be clenched, the thumbs buried in the palms with flexion of the great toes. There may be frothing at the mouth, disturbed respiration with a slow or rapid irregular pulse, general or localized, sweating of the forehead and blueness of the lips and face. The sphincters may become relaxed, the urine and feces being expelled involuntarily. After the spasm there is usually evidence of prostration, and temporary palsies not infrequently follow, due to exhaustion of the nerve-centers. One attack of convulsions is commonly fol-

* Presented before the Sixth District Medical Society at Bismarck, N. D., April 5, 1938.

lowed by others, exhibiting an increasing susceptibility.

Diagnosis

The number of diseases in which convulsions may occur is great. Griffith and Mitchell in "Diseases of Infants and Children" mention seventy conditions in which eclampsia may occur and Kitchens in his work on "Diagnosis" mentions sixty. Most important is the diagnosis of the cause of the convulsions. This requires careful study of the history of the patient and of all the symptoms present. Almost anyone of moderate intelligence will readily recognize a well-marked convulsion or even a convulsive tendency; but it is of the utmost importance that the observer carefully note and be able to relate accurately the starting point and phenomena of progress, the degree of severity, and the length of time it has persisted. On these facts will depend a proper diagnosis of the character and seat of the irritation. The slightest twitching of the thumb may indicate irritation or disease near the motor area, and twitchings of the eyelids and movements around the corners of the mouth may point to central disease. Convulsions occurring in most forms of brain disease, excepting meningitis, are not accompanied by marked rise in temperature but may exhibit pupillary changes, strabismus, rigidity, or localized palsies. In the first few days of life, eclamptic attacks are usually due to traumatic hemorrhage, or to asphyxia from atelectasis. These are attended by cyanosis. Organic disease is most commonly responsible for attacks which come on in the first three or four months of life, but during the remainder of the first two years they are usually due to spasmodophilia. Hyperpyrexia seldom accompanies convulsions due to reflex irritation or spasmodophilia. Uremia and diabetes should not be forgotten, and the urine should always be examined. Tetanus and strychnine poisoning should be considered. The history, onset and nature of the spasms should differentiate the two. Consciousness is retained in both conditions. Rickets, likewise, should not be overlooked.

The differential diagnosis of eclampsia and epilepsy is often very difficult. In infancy, idiopathic epilepsy is rare. In the majority of instances it does not occur until after the age of three. Later in childhood the diagnosis of epilepsy is probable if the attacks recur, especially if they are accompanied by an aura, a fall or a sudden cry. A deep stuporous sleep lasting more than five or seven minutes is very suggestive. Fever is also absent. In many instances time only can determine the diagnosis.

Treatment

Preventive measures are of the utmost importance but at times may be difficult to carry out. They can only be accomplished when the physician has full supervision in the prenatal periods and has the opportunity of carrying out early periodical examinations of the child. A systematic search for and removal of underlying causes should be made. This includes a wide field of investigation beginning with the habits, temperaments

and disorders of the parents, especially of the mother. In children who are hereditarily predisposed or have had previous attacks of convulsions, the diet should be carefully supervised. Foods which produce indigestion should be eliminated. Rickets, if present, must be brought under treatment as rapidly as possible. Over-excitement and fatigue are to be avoided. The existence of spasmodophilia should be looked for and if present the treatment indicated must be instituted.

Treatment of the distressing phenomena during an attack ("first-aid treatment") is urgent and should be systematic. There is nothing that upsets a mother more than the terrifying spectacle of her child in convulsions. Usually when the doctor arrives he finds the child in a tub of hot water. In the excitement this may have been too hot. For the benefit of the child and for one's own protection, it is well to remove the child at once in order to ascertain that no burns have been inflicted. If still dressed, the clothing should be removed and the child wrapped in sheets or turkish towels which have been dipped in a mustard-water solution at a temperature of 98 or 100° F. If the fever is high, apply ice packs to the head. To overcome the convulsive explosions, chloroform inhalations are effective and safe. If the history indicates that the child's stomach is filled with food, I give apomorphine hypodermically in suitable dosage to produce emesis. Vomiting being easily induced in children, there need be little fear of injurious effects from it. Apomorphine is an opium derivative and acts also as an antispasmodic. A cleansing saline enema removes toxic feces and undigested food, and if hot, aids in capillary relaxation and diuresis. If the convulsions are unduly prolonged, the use of morphine hypodermically is both safe and gratifying. The dosage ranges from 1/150 to 1/100 of a grs., depending upon the age of the child. This dose may be repeated within one or two hours until effective. Some authorities regard this as dangerous but a long-continued convulsive state may be more dangerous. It is often the only measure which will effectively check the convulsions. After the effect of the morphine has subsided and the child still shows a tendency to convulsions, chloral hydrate, ½ grain for each month of the child's age, in an ounce of water as a retention enema is alleviating. This may be repeated within an hour if necessary. A 3 gr. capsule of sodium amytal per rectum may be given instead of chloral hydrate. By puncturing both ends of the capsule and dipping it into warm water, insertion and absorption are enhanced. Lumbar puncture is indicated in some cases to relieve cerebral congestion. As soon as the child can swallow, it is well to give one or two grains of calomel or a large dose of castor oil.

After having instituted these measures to overcome the convulsions, a thorough search should be made for such sources of reflex irritation as phimosis, an erupting tooth, foreign bodies in the nose or ears. Other conditions to be looked for, are pneumonia, meningitis, exanthemata, spasmodophilia, diabetes, uremia, tetanus and rickets.

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FELLOWS OF THE AMERICAN MEDICAL ASSOCIATION

A recent compilation of the membership of physicians in the American Medical Association gives high rank to the physicians of the middle Northwestern states represented by Minnesota, the Dakotas and Montana.

This compilation discloses that there are approximately 169,000 physicians in the United States, and that about 68,500 are fellows of the American Medical Association. This represents an average in the United States of 31.1 per cent of all physicians as fellows in the Association.

It is noteworthy that the Northwestern states have high percentages of their physicians as fellows in the Association. North Dakota leads all of the states with 48.5 per cent of all its physicians as fellows in the American Medical Association. Minnesota is fourth with 47.3 per cent; Montana is sixth with 46.2 per cent; and South Dakota is thirty-eighth with 34 per cent. This makes an average of approximately 44 per cent for the Northwestern states and compares very favorably with the average for all of the states of 31.1 per cent of physicians in the American Medical Association. This participation of physicians in the states which the JOURNAL-LANCET represents, discloses that our Northwestern physicians are most actively interested and concerned in their professional organizations and pays indirectly a high tribute to their professional character.

H. D. B.

MEDICAL EXAMINATION FOR A DRIVER'S LICENSE

Drivers' licenses are issued too freely. When accidents occur on the road, the blame is usually placed upon defective motors. Spasmodic safety campaigns have been sponsored by auto clubs, and tests are made from time to time by police traffic departments to determine the efficiency of brakes and the proper focusing of headlights; but what about the man at the wheel?

The prospective driver exchanges twenty-five cents over the counter for a little card that entitles him to operate a motor vehicle. His vision, hearing, reflexes, and coordination are not tested before the collision takes place and the damage done.

With an increasing number of vehicles on our highways, let us place the responsibility for accidents where it rightly belongs. A perfunctory questioning of the applicant's age and years of driving experience is not enough. He should be required to pass a thorough examination at the hands of a physician at least once a year. Such an examination should be regarded as a serious matter; and very definite rules should be laid down in order that uniformity might prevail. Exophoria is not confined to headlights. Good brakes and steering wheels can only perform their functions when rightly applied.

Railway employees are tested at frequent intervals for public safety even though their engines run only on tracks of a clearly designated right-of-way where flag-

men, gates, and signals are required by law.

We must do away with defective motors on our highways, but even more, with the incompetent operator who arrogates the right of public domain on the basis of a "two bit" card-board license that did not even call for a personal appearance when it was issued.

A. E. H.

OBSERVATIONS ON DISEASES AMONG NORTH CENTRAL INDIANS

Physicians who have treated both whites and Indians for any considerable period of time have noted the relative infrequency of certain diseases among the Indians. This is true of a group of diseases that are of ever increasing importance among the adult white population. In order to obtain definite data I requested the South Dakota State Board of Health to give me the death rate among the whites and Indians for the year 1937, from heart disease, cancer, apoplexy, diabetes and nephritis. In return I received the following report:

	Diseases of the Heart		Cancer All Forms		Apoplexy		Diabetes		Nephritis All Forms	
	Wh.	Oh.	Wh.	Oh.	Wh.	Oh.	Wh.	Oh.	Wh.	Oh.
January	110	0	55	1	45	1	18	0	35	0
February	79	2	38	1	38	0	14	0	29	0
March	119	1	47	2	38	0	16	0	35	0
April	96	3	39	0	53	0	10	0	26	0
May	101	0	43	0	42	0	8	0	11	1
June	102	3	47	1	36	0	7	1	25	0
July	80	1	52	0	36	1	9	0	19	1
August	78	0	55	1	39	0	8	1	19	1
September	75	3	43	1	44	1	9	0	15	0
October	104	2	55	0	33	0	10	0	22	0
November	87	1	55	0	33	0	12	0	37	3
December	108	1	45	1	40	0	12	0	24	2
Totals	1139	17	574	8	477	3	133	2	297	8

As there are practically no blacks or orientals in South Dakota "others" is to be interpreted as Indians.

South Dakota has undergone certain changes in population but from the best information available, it is probable that our white population is now about 640,000 and our Indian population about 30,000. Using these figures the death rate per 100,000 would be approximately: diseases of the heart: whites 178; Indians 55. Cancer: whites 90; Indians 26. Apoplexy: whites 74; Indians 10. Diabetes: whites 20; Indians 6. Nephritis all forms: whites 46; Indians 26.

There is reason to believe that the favorable position of Indians in regard to these diseases is gradually being lost and that the incidence will in time approximate that of the white population. The difference in the death rate from these diseases, in my opinion, is due to the higher Indian childhood and adolescent death rate. The sub-standard Indian, until recently, had a poor chance of reaching maturity and perpetuating his kind. It is probable, as the Indian childhood mortality approaches that of the whites, that his death rate from these diseases will become approximately that of our general population.

A. S. R.

Book Notices

YOUNGKEN ON PHARMACOGNOSY

A Textbook of Pharmacognosy, by HEBER W. YOUNGKEN. A.M., Ph.M., Ph.D., Sc.D.; 4th revised edition, 469 illustrations containing 1500 figures, 872 pages plus index and bibliography, pebbled maroon cloth, stamped in black-and-gold; Philadelphia: P. Blakiston's Son & Company: 1936. Price, \$7.00.

It is not certain, in these times of the super-efficient apothecary and the ingenuity of the pharmaceutical manufacturer, that the physician needs to be steeped in pharmacology and pharmacognosy as a part of his formal education; yet it were better that this were so. Anything that will enlarge the periphery of the physician's knowledge and experience assuredly is worth its toll of acquisition.

This work, by the professor of pharmacognosy and materia medica in the Massachusetts College of Pharmacy in Boston, is an excellent text. It has been revised to meet the exactments of the 11th U. S. Pharmacopoeia, and the 6th U. S. Formulary, both of which were published last year. It is notable to notice in this 4th edition of YOUNGKEN's work that he has introduced many new cuts, so that the volume really is beautifully illustrated. Moreover, he has included the official bacteriological products, a procedure which all physicians ought to approve. THE JOURNAL-LANCET is pleased to recommend this work on pharmacognosy.

WAYS OF BEHAVIOR: HOPKINS, et al.

Integration: Its Meaning and Application, by L. THOMAS HOPKINS, A.B., A.M., Ed.D., and others; 1st edition, brown cloth, gold-stamped, 301 pages plus appendix, bibliography, and index, no illustrations; New York: The D. Appleton-Century Company: 1937. Price, \$2.00.

For medical social workers, for psychiatrists, and for sociologists, this volume should be of value. It is too sharply restricted for most practitioners, however, and strictly speaking, is not concerned with medical problems outside the implications of psychiatry and psychiatric therapy. The senior author is professor of education in Teachers College of Columbia University in New York. Hospitals and psychiatrists would seem to be the medical audience to profit most by this volume.

MAYO CLINIC VOLUME FOR THE PUBLIC

The Mayo Clinic, by LUCY WILDER, with illustrations by RUTH BARNEY; 2nd edition, blue cloth, stamped in white, 96 pages, no index, no bibliography, illustrated; New York: Harcourt, Brace & Company: 1938. Price, \$1.50.

This is essentially the same volume that was reviewed in THE JOURNAL-LANCET in the August 1936 issue. The new edition has a roster of the staff of the Mayo Clinic, and minor changes. The author is the former wife of RUSSELL M. WILDER, of the section on medicine of the Mayo Clinic. The same illustrations appearing in Mrs. WILDER's privately-printed (1936) edition are used in the current edition.

News Items

The establishment of a children's psychiatric clinic at the University of Minnesota medical school has been made possible by a \$50,000 gift from the trustees of the Home for Children and Aged Women of Minneapolis. The money will be provided over a five-year period, \$10,000 being allotted annually for the first three years and as much of the balance as funds permit for the remaining two years.

Physicians from Minnesota and the northwest completed a week's instruction in X-ray diagnosis at the University of Minnesota in June. University medical faculty members, under the chairmanship of Dr. Leo Rigler, professor of radiology, reviewed latest developments in the field by lectures, demonstrations and clinics.

Under the sponsorship of the Goodhue County Public Health association, children's clinics were held at various towns in the county in Minnesota last month. The examination was free for all children up to twelve years of age.

President Roosevelt has signed a bill inaugurating a war against venereal diseases. Approval of the measure, sponsored by Senator La Follette, Progressive of Wisconsin, climaxed a twenty-year campaign by medical men and public officials to overcome public reticence and obtain Federal assistance to fight syphilis and gonorrhea.

Dr. Anton J. Carlson, head of the department of physiology at the University of Chicago, spoke at the fortieth anniversary observance of the founding of the Swedish hospital in Minneapolis, Minnesota, June 3.

Dr. Will H. Moore, Valley City, North Dakota, was elected president of the North Dakota Health Officers association succeeding Dr. G. U. Ivers, Fargo. The meeting preceded the formal opening of the fifty-first annual meeting of the North Dakota State Medical association. Other officers are: Dr. W. A. Wright, Williston, vice-president, and Dr. Maysil L. Williams, Bismarck, secretary-treasurer.

All officers of the Montana Catholic Hospital Association were reelected at the annual convention held in Missoula, Montana. Havre was selected as the site of the next annual gathering, with Deer Lodge chosen for the mid-year meeting in November.

A two-day institute for county health nurses in Gregory, Tripp, Hutchinson, Union, Clay, Aurora, Brule, Douglas and Charles Mix counties was held in Wagner, South Dakota, in May. Ruth Kahl, representative of the U. S. public health service, attended the meeting.

A medical and dental clinic was held at Dell Rapids, South Dakota, under the direction of the state board of health in May. During the course of the clinic, 78 children were immunized for diphtheria and 42 were vaccinated for smallpox.

A St. Louis county tuberculosis hospital has been advocated by four organizations in Northern Minnesota. Latest to back the move was the Virginia Chamber of Commerce. Others seeking establishment of the institution, because of overcrowded conditions at Nopemung sanatorium, are the Virginia, Ely and Eveleth city councils.

Dr. H. S. Lippman, St. Paul, Minnesota, has been named a member of the American Psychiatric association. The information was received last month from the association's headquarters in New York City.

The University of Minnesota has received a gift of \$37,000 from the Commonwealth fund of New York to be used for postgraduate medical education. The fund, to be disbursed over a period of five years, will provide a series of advanced courses in at least five branches of the medical profession.

One hundred fifty-one children attended the clinic held in Vermillion, South Dakota, last month. The clinic was sponsored by the Parent-Teachers' Association, and held in coöperation with the state board of health and the local doctors and dentists. Complete physical examinations were given.

At the clinic for physically handicapped persons held last month at Aitkin, Minnesota, 97 crippled children were examined. The clinic was under the supervision of the Division of Services for Crippled Children of the State Board of Control in coöperation with the Minnesota Public Health Association and the Division of Vocational Rehabilitation of the State Department of Education.

A refresher course in obstetrics and pediatrics was conducted in Bemidji, Minnesota, last month. Doctors from Beltrami, Cass, Itasca, Hubbard, Clearwater, Koochiching and Polk counties attended. The course was sponsored by the Minnesota Department of Health. Lecturers were: Dr. W. Ray Shannon and Dr. Frank G. Hedenstrom of St. Paul, Dr. William A. Coventry and Dr. James R. Manley of Duluth.

Dr. H. W. Lee, Brainerd, Minnesota, who for the past year has been associated with Dr. Nesmith Nelson in an eye, ear, nose and throat practice, has been appointed to the staff of Ah-Gwah-Ching sanatorium at Walker, Minnesota. Dr. Lee will retain his practice in Brainerd, absenting himself from the city about two days a month to act as head consultant for cases in his field at the sanatorium. Ah-Gwah-Ching is a state sanatorium for the care of tubercular patients.

Dr. Henry F. Helmholtz, head of the pediatrics section of the Mayo Clinic, was installed as president of the American Academy of Pediatrics at the annual convention of the society in Del Monte, California, last month.

Dr. W. R. Kostick, formerly of Robbinsdale, Minnesota, is now practicing in Fertile, Minnesota. Dr. Kostick was graduated from the University of Minnesota medical school in 1934.

Dr. D. W. Cummings, Hibbing, Minnesota, has resigned as Hibbing school doctor.

Dr. Raymond E. Buige, Dr. Charles E. Craft and Dr. Carl Lind, Jr., teaching fellows in the University of Minnesota medical school, have been awarded fellowships by the National Advisory Cancer council of the United States public health service. The past three years, the three have taken special training in the department of surgery at the University. They will devote two to three years in the study of cancer according to the terms of the fellowships.

Dr. A. W. Shaw, formerly of Buhl, Minnesota, has moved to Virginia, Minnesota. Dr. Shaw is one of the pioneer physicians on the Range; for many years he operated the Shaw Hospital at Buhl. He comes to Virginia from California where he has been residing since giving up private practice at Buhl early in 1937. Dr. Shaw was graduated from the University of Minnesota medical school in 1899.

Dr. R. E. Priest of Worthington, Minnesota, has given up his practice to take graduate work at the University hospital, Minneapolis. Dr. Priest, who was graduated from the University of Minnesota medical school in 1932, has been a member of the Worthington Clinic for the past five years. His graduate work will consist of a three-year course of eye, ear, nose and throat work.

Dr. Nelson Young, Grand Forks, North Dakota, was elected president of the North Dakota Academy of Ophthalmology and Otolaryngology at the annual meeting held in conjunction with the state medical association convention.

Dr. A. F. Dworak, of Omaha, Nebraska, has opened offices in Montgomery, Minnesota. Dr. Dworak was graduated from the University of Nebraska in 1930; he served three years in the medical corps of the U. S. government, and then became associated with Dr. J. F. Bicek in St. Paul, Minnesota.

Dr. Maysil Williams of Bismarck, North Dakota, state health officer, recently discussed pre-school conferences, baby clinics and the history of health work, before the Grand Forks county advisory committee on health.

Necrology

Dr. H. A. Schneider, 62, of Owatonna, Minnesota, died May 7, 1938. A graduate of the University of Minnesota medical school in 1901, Dr. Schneider began his medical practice in Stillwater. The next year he moved to Jordan, Minnesota, where he practiced until he was forced to retire because of ill health, in 1934. He had been living in Owatonna the past four years.

Dr. Holland T. Ground, 55, formerly of Virginia, Minnesota, died suddenly at Grants Pass, Oregon, May 29, 1938. Dr. Ground, who was at one time city health officer, left Virginia in 1929 to make his home at Burns, Oregon, where he operated a hospital. In July, 1937, he sold his practice and moved to Grants Pass. He was graduated from the University of Illinois in 1907.

Dr. A. M. Kendahl, 60, of Jasper, Minnesota, died in Rochester, Minnesota, May 31, 1938. A graduate of the University of Illinois in 1909, Dr. Kendahl had practiced in Jasper for 29 years.

Dr. John Crawford, 66, of New Rockford, pioneer North Dakota physician, died May 23, 1938. Dr. Crawford was graduated from the University of Ontario in 1894; in 1896 he moved to Moorhead and a year later started practicing in Esmond, North Dakota where he remained until moving to New Rockford in 1912. He was a past president of the North Dakota State Medical Association.



HENNING F. B. WIESE

1889-1938

Dr. Henning F. B. Wiese was born in Nordfjord, Norway, June 17, 1889, and passed away in Minneapolis, Minnesota, April 29, 1938. His paternal great-grandfather and grandfather were physicians in Norway. His maternal grandfather and one uncle also practiced medicine in Norway. One of his brothers is a physician in Norway and a sister is married to an English physician who resides in Paris, France.

Dr. Wiese attended the Gymnasium at Oslo, Norway, from 1904 to 1907, after which he entered the University of Oslo, graduating in 1915 with the highest honors of his class. He served his internship in the Rikshospitalet in Oslo, at the end of which time Dr. Mathiesen of Eau Claire, Wisconsin, who was Dr. Wiese's godfather, invited him to spend some time with him and Dr. Midelfart in their clinic, which he did, staying one and one-half years. From there he entered the Mayo Foundation at Rochester, Minnesota, where he spent three years. He was called by Dr. Schilling, the chief surgeon, to the Ullevaal Sykehuse in Oslo, Norway, at which hospital he served as surgeon for two and one-half years.

He received the degree of Master of Science in Surgery in 1922 from the University of Minnesota. He was a Fellow of the American College of Surgeons and the American Medical Association and a member of the Minneapolis Surgical Society. He was a member of the Kristiania Surgical Society and the Norwegian Medical Society; also a member of the Alumni Association of the Mayo Foundation.

He was a member of the Surgical Staffs of Asbury, Swedish, Fairview and Deaconess Hospitals.

Dr. Wiese was married on December 16, 1922, to Juanita Wood, daughter of Fredrick and Fanny Wood of Eau Claire, Wisconsin. They have two children, Karen, age 14, and Stetson, age 11.

Dr. Wiese maintained in his surgical diagnosis and technique a perfection that few attain.

The life and work of the medical man are brief and often too soon forgotten but the great principles of ethical conduct to which he is committed are age-old and permanent. I like to believe that the memory of Dr. Wiese will live for all time in these great principles.

C. C. K.

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BISMARCK, NORTH DAKOTA

May 16-17-18, 1938

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PROCEEDINGS

of the
HOUSE OF DELEGATESof the
FIFTY-FIRST ANNUAL MEETINGof the
NORTH DAKOTA STATE MEDICAL
ASSOCIATION

Monday, May 16, 1938

The first meeting of the House of Delegates was held in the Dining Room of the World War Memorial Building, Bismarck, North Dakota, and was called to order at 10:30 A. M. by the President, Dr. E. L. Goss, Carrington.

Roll Call

Secretary Skelsey called the roll, and the following delegates, councillors and officers responded:

Doctors:

E. L. Goss, Carrington
Albert W. Skelsey, Fargo
Murdock MacGregor, Fargo
G. M. Williamson, Grand Forks
A. R. Sorenson, Minot
N. O. Ramstad, Bismarck
P. G. Arzt, Jamestown
F. W. Fergusson, Kulm
John Crawford, New Rockford
A. E. Spear, Dickinson
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J. C. Swanson, Fargo
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W. A. Liebler, Grand Forks
I. S. AbPlanalp, Williston
E. J. Beithon, Hankinson
Will H. Moore, Valley City
R. H. Waldschmidt, Bismarck
O. T. Benson, Glen Ullin
A. P. Nachtwey, Dickinson
F. O. Woodward, Jamestown
Syver Vinje, Hillsboro

The president declared a quorum present, and the House duly constituted for the transaction of business.

Minutes

Secretary Skelsey moved that the minutes of the Fiftieth Annual Session as published in *THE JOURNAL-LANCET*, August, 1937, be adopted, and the reading of the minutes omitted.

The motion was seconded by Dr. A. P. Nachtwey of Dickinson, and unanimously carried.

Secretary Skelsey stated that a letter had been received from Dr. Arzt of Jamestown in which he wrote:

"May I suggest you arrange a time for a meeting of the Economics Committee as well as the Executive Committee, as I believe a very thorough discussion should be had in regard to the set-up of the Welfare Board and FMAC at present existing."

Dr. SKELSEY: The President wants me to make the additional announcement that luncheon will be served in this room at 12:45.

It is requested also that delegates and councillors will be in this room at 1:30 when the registration committee will come to register you and collect the fee.

I am also requested to announce a meeting of the Committee on Venereal Disease at lunch time in this building today.

President Goss called for the annual report of the secretary.

Report of the Secretary

Secretary, Dr. A. W. Skelsey, presented the following report:

There was a membership of 380 for the calendar year of 1937. To date this year a membership of 386.

Detailed statement of receipts is attached to this report.

Two new standing committees have been created, viz.: Radio and Venereal Disease.

Throughout the whole country health conditions compare favorably with last year's data. Smallpox has increased presumably due to the laxity in vaccinations; and measles outbreaks have been fairly frequent in some areas. Appalling death rates from automobile accidents increase; the total deaths for the year 1937 reaching about 40,000; 375,000 permanently injured, and about one million moderately injured. Those pacifists who are against war and preparedness for war might also direct their activities against this carnage from automobiles.

A decided birth decline in the United States; apparently the largest declines in certain southern states, whether among the colored or the whites our statistics do not show.

Dr. Maysil Williams of our State Board of Health notifies us that the preliminary count of our own birth certificates (1937) indicates that there were eleven hundred less births filed than in the year 1936. While a few of the extremely drought-stricken areas show a moderate decline, other better situated counties indicate a greater decline in births. Barnes County drops from 339 in 1936 down to 256 for the year 1937. Cass County in the Valley of Birth Control has a decrease of 35.

North Dakota Medical School: Last year the A. M. A. Council on Medical Education dropped our School from its approved list, but under protest against such expulsion and through promises that our legislators would increase the School's appropriations, the institution was placed on probation.

The Cults: In different parts of the State, the Irregulars are active in publicity. One spine-adjuster carries periodic advertisements, included in which is the oft-repeated statement that he "has never failed in a single case of pneumonia in over twenty-five years." While this bold assertion might make the angels weep, it should also attract your attention to other flaming types of cultists' advertisements. Perhaps the cases of pneumonia referred to above were like unto "errors of mortal mind" defined in Christian Science literature, i. e.:

"Sickness is not a reality. Tumors, ulcers, tubercles, inflammation, pain, deformed joints are waking-dream shadows, dark images of mortal thought, which flee before the light of TRUTH."

The Supreme Court of Iowa recently rendered a decision relative to cult practices. The defendant was licensed as a chiropractor. The decree of the trial court was affirmed, with the further injunction that the defendant should be wholly enjoined from—

Prescribing or advertising as to diet;

The use of physiotherapy or electrotherapy; and in

general from the use of mechanical or electric means or modalities; in order words, from any course of treatment other than chiropractic adjustments;

To refrain from the duties of a physician or a surgeon.—(*Detroit Medical News*, May 9, 1938.)

Foreign Physicians: The *Associated Press Dispatch*, Chicago, February 15, 1938, printed the following news:

"The influx of foreign physicians, because of political conditions abroad during recent years, provides licensing medical authorities in the United States with a decided problem. Various aspects of it were presented by Dr. Pinkham, Secretary, California State Medical Examining Board, at the national congress on medical education and licensure. Since our native medical profession is already increasing faster than our population, the foreign influx will 'add an hundredfold to the already serious condition,' according to Dr. Pinkham. In addition, the problem of foreign students now also includes that relating to American students, who because of American restrictions in enrollment, cannot enter our medical schools. He reported that during the fiscal year ending June 30, 1936, 537 alien doctors entered our country; the next year the number was 533. Of the year 1936 group, 312 were from Germany. Licensing Boards are finding it extremely difficult to validate the credentials of foreign medical graduates.

It is alleged that medical training in some foreign countries is now inferior to that in the United States. In the year 1936, thirty-five per cent of the 588 foreign graduates who were examined in this country failed to pass the examinations. (*J. Cal. M. S.*, April, 1938). He commented on the frequency with which graduates of German medical schools file a large document printed in Latin on thin paper and showing (lower margin) what purports to be the seal of the institution; the "seal" also being printed thereon. Such a document purports to be a copy of the applicant's medical diploma. When questioned, the applicant explains that his original medical diploma is kept in the archives of that foreign university, and that a graduate may secure several printed "copies" for use. Dr. Pinkham wondered how many alleged foreign medical school graduates are foisted on the public via a local print shop. (We presume that the doctor has reference only to former acceptance of such foreign diplomas for which U. S. medical licenses were issued under reciprocity courtesy which may have unwisely been granted). In his service of many years he has uncovered many fraudulent credentials, including purported medical diplomas. (*J. A. M. A.*, April 16, 1938.)

Some states may demand that hereafter American students returning from abroad with foreign diplomas must take the last year's work in an American Grade A medical college, before admission to practice. This might afford a better check than a year's internship here. Several years ago a very clever Jap by means of a supposedly foreign medical diploma got internship in American hospitals, but eventually he found the jail and its shelter.

State Hospitals in North Dakota: During the past twelve months, there have been unfortunate episodes connected with these institutions, which illustrate the evils of party politics and the patronage system. Seemingly no substantial relief can be obtained until civil service is adopted or at least some practical form of non-political control. When these disturbing events occur, one gets the impression that some members of the state medical association believe that a physician employed in those hospitals subjects himself or herself to the political game of "Ins and Outs," and that every state employee is very astute and plays in luck if he or she can retain the position for even the average two-year political tenure of office.

This notation about party politics and procedure is not aimed at any one political party. It can well apply to all of them. The state medical association, by itself, cannot install into our state hospitals the non-political system of control. On the other hand, as regards our educational institutions, you have noticed the very energetic rebound on the part of state students,—the ebullition of youth, especially in Fargo, against alleged party politics and some threatened disruption of our state colleges. We do not insist that all students possess all wisdom and matured judgment, yet here we have discovered through their vigorous protests and actions a snap and an

ability to rally against what they consider harmful influences.

We should also admit freely and thankfully that the state during the past year has very generously provided new buildings and equipment necessary for the sick and the afflicted, and this too during a depression period.

If, now, politics could be kept out of hospitals, there would be more incentive for physicians to accept service there, and then quite probably the North Dakota medical profession would be yet more willing to cooperate with them.

On May 3, 1938, the directors of the regular North Dakota State Taxpayers Association endorsed for state constitutional amendment, the removal of the institutions of higher learning from control of the Board of Administration, and the placing of their affairs in the hands of a non-paid, non-political commission. (It is questionable whether this should be a non-paid commission, because such an office would entail time and expense of the members thereof.)

Doctors, Drugs and Druggists: Some fatal results through the use of new drugs and sera have occurred as well as many deaths from an elixir of sulphanilamide and from a reputed cancer cure. The use of sulphanilamide has developed to an enormous extent. As a result the drug, even in proprietary form, has become well known, and not only do a great number of prescriptions go into regular drug stores and the drug rooms of hospitals, but also to the public, by way of the counter-prescribing druggist. Dr. Schnitker of Harvard has made the latest reports on the use and the toxicology of the drug.

Interallied Professional Alliance: Some discussions as to the relative value of such an arrangement have been held. A plan had been developed in South Dakota, but the combination evidently was rather top heavy, and regarded with suspicion by legislators and their political following. North Dakota conferences were had with representatives of the druggists, dentists, hospitals, etc., and it was deemed better for the present, rather than utilize the exact plans of other states, merely to have an understanding that when necessity arose representatives could meet in consultations.

The annual report of the North Dakota Pharmaceutical Society for the year 1937 contains valuable material, and is of much interest to physicians. It includes an excellent heart-to-heart talk by our Dr. George M. Williamson of Grand Forks. Almost the last three pages of his address are marked as "off the record," but the reporter has thrown it all into public print. The doctor attacked the druggists' counter-prescribing; next pitched into the physicians for so freely handing out to patients liberal samples of medicine; criticized medical schools on their lack of thorough instruction in materia medica, and claimed that some recent graduates coming up for state board examinations were grossly ignorant of therapeutics, even though they have had the benefit of a hospital internship.

Secretary Sudro of that society objected decidedly to the installing of liquor shops under the guise of drug stores.

Mr. Mull of the Lilly Company told the "assembled ladies and gentlemen" that whether they liked to admit it or not, the retail drug business has been in the process of degeneration for twenty years,—part of this, he alleged, due to the decline of the prescription trade. (He might have charged up to the hospital drug rooms, now much more freely used by doctors than formerly, the large number of prescriptions now lost to the druggists.) Mr. Mull claimed that as a matter of fact the druggist has indulged in so many funny gyrations during the last several years, that he no longer enjoys the prestige that was his. He believes that the antagonism between druggists and physicians is caused by counter-prescribing, types of advertising, etc. He refers to a campaign of fear through radio and advertisements, and asserts that there is a threat of destruction in practically every announcement pertaining to health.

The Rockefeller Foundation sent a representative into North Dakota for a state survey relative to medical and social affairs, and its findings are about what we might expect from such a Foundation. Its implied statistics about what it designates "the enormous item" account of syphilitic patients at the State Hospital, Jamestown, requires more accurate data than indicated. The report of our State Hospital at Jamestown for the two years ending June 30, 1936, shows that during such two years'

period there were admitted 828 patients, among which there were only nineteen persons (11 males, 8 females) chargeable to syphilis. As for the Grafton State Hospital, upon inquiry of Dr. James P. Aylen, late superintendent there, he states that during the two-year period above referred to, there were no admissions chargeable to syphilis; that the institution had only about four syphilitics, and that two of them include females who had been sterilized and let out on parole, from which parole they returned with syphilis.

The Toomey-Newell Bill in the New York Legislature requiring laboratory tests for all expectant mothers has been strongly opposed as an undue and even unlawful interference and intrusion into the private affairs of the individuals and the family.

(A comment in this connection, and irrespective of the question of venereal disease, is this: That with the mass of general health propaganda swinging throughout the country, once an organization is given money, political control and pull, there seems to be no end to the noise and activity of those agencies.)

It has been suggested by the *Journal Ohio State Medical Society* that we use the phrase "tax-supported medical service," instead of the rather hackneyed and incoherent term "state medicine." Nothing like letting the taxpayers realize that they are footing, and will continue to foot, the bills for governmental, bureaucratic medical service.

California: Medical practice there is very complicated. Several years ago the politicians tried to formulate and legalize so-called state medicine. In 1934 the California State Medical Association was accepted by the Federal Relief Administration as "supporting sponsor" of the proposed California Medical Economic Survey. The Survey is finally embodied in a volume issued by that state medical society, the work having been completed to the satisfaction of the FERA-WPA. The Bureau of Medical Economics has reviewed that book in the *J. A. M. A.*, Feb. 26, 1938, pp. 117B-119B. We quote two criticisms from this Review:

"There is a tendency throughout the published tables to exaggerate the lack of medical care, the cost of such services, and the implied defects of the medical profession, by the arrangement of the tables and the wording of the captions."

"The tables and the figures in this report give the reader the impression that there has been an effort to arrange a build-up for sickness insurance."

California: New by-laws governing suspension and expulsion of members: Los Angeles County Medical Society some months ago had great difficulty in attempting to suspend or expel a non-ethical group of doctors, and finally were compelled by action of the Judicial Council A. M. A. to re-instate that group. The local organization is now in accord with the Constitution of the State Medical Association, and adopts new and stringent by-laws to effect better means of discipline.

Washington, D. C.: Plans are now under way by the Federal Home Loan Association for group health insurance. It is claimed that if the scheme can be proved lawful and successful, this system of group health insurance may be applied to all federal employees.

Washington, D. C.: March 28, 1938. "Medical Stand Probe Sought." Representative Scott (Dem.) of California introduces a resolution in the House asking creation of a committee of five Congressmen to investigate opposition of the American Medical Association and its subsidiaries to group medical programs. Scott's resolution proposed the committee investigate "whether the Associations are engaged in activities prejudicial and detrimental to health, life and well-being; whether violators of laws or charters are involved in action of the medical associations."

High Pressure Medical Health Propaganda: In their zeal to transform this world into an one hundred per cent health bower, much lurid literature and fervid oral statements keep increasing. The momentum apparently has its fountain-head in the Washington socialist headquarters; thence spreading into various states and all local areas. Naturally, the medical organizations have been enlisted in these crusades, which is proper to a reasonable extent, yet from perusal of state medical journals, newspapers, magazines, and even via the radio if one cannot get away from it, comes the flood stream about health and its wonders. Unfortunately, some of this material has a

tendency to place the medical profession on a rather low plane, from which it might appear some of the committees in their zeal to aid the cause of robust health and all that, copy almost verbatim the verbiage emanating from Washington and its subsidiaries. This, then, has given rise to a moderate amount of resentment among some of the medical men who feel their fraternity is getting unwarranted censure and that, too, from their own profession. While the objects of our committees in the various states, working with and almost regimented by the governmental agencies, are doubtless for the very best, more care might be exercised that they do not "swallow hook and bait" all that comes out of Washington and other centers of social service and reform.

Your attention is called to an editorial in the J. A. M. A., April 16, 1938, censuring MacFadden's *Liberty* and its so-called recent exposé of medical practice and the alleged evils of our ethics. The editorial states that from all over the country the A. M. A. has received vigorous protests from non-medical readers of *Liberty* and from physicians. (This paragraph can be utilized in connection with that one preceding.)

Medical Economics: The national depression has affected the physicians in various ways, and possibly one of the most disagreeable features, due in part to the newly created socialistic measures of the government and the states, has been the unwarranted and injudicious criticism of the medical profession. We are freely accused of being indifferent, mercenary, and not of high standard professionally. It is said that our neglect of the needy and suffering has been criminal.

Last year the bewhiskered and uncious U. S. Senator, Mr. Lewis, introduced a joint bill into Congress aiming to enforce both fines upon and imprisonment for those physicians refusing to accept calls from the needy sick, but as balm for what he suspected would be objections on the part of governmental control of sickness, he offered financial compensation for services rendered, which system of course would spell politics and intrigues.

Within our own borders we have not been entirely free from problems and criticisms. The formation last year of that Easter Committee of 430 physicians, issuing a declaration demanding changes in our system of practice, gained adherents. This April the Associated Press spread news that Dr. Means of Boston, President of the College of Physicians, in his recent annual address, had made a vicious attack against the A. M. A. and its members. The J. A. M. A. April 16, 1938, carried an editorial stating that Dr. Means and some of the physicians in the College, deny using such language. Incited by this sensationalism, the newspapers took up the hue and cry, so again we loomed into the limelight. Even the theologues thought it worthwhile to take a whack at us. The *Churchman* (N. Y.) of April 15, 1938, sprouted the following editorial gem:

"MEDICAL REVOLT"

"Revolt against the methods of the American Medical Association on the part of progressive medical men came to a dramatic focus in the address of Professor James H. Means of Harvard Medical School and President of the American College of Physicians. He called upon all physicians 'who believe in popular government to bestir themselves' and organize 'an effective opposition party' to the American Medical Association. 'The behavior of the American Medical Association is political,' said Dr. Means. 'It is partisan behavior. It champions a cause. At the present time the cause is something close to stand-patism.' The membership of the A. M. A., he added, 'is allowing the medical politicians to run things about as they please,' and 'to hurl their thunderbolts of wrath at all who differ with orthodox doctrine.' He declared that what was wanted was 'no society of yes-men, but genuine thinkers, and if we are to have genuine thinkers we are bound to have diversity of opinion, because, as a speaker I recently heard, remarked, 'The only persons who think alike are those who do not think at all.' There is, indeed, no place for yes-men in a truly learned society, nor is there place for political maneuvering, or reprisal for the expression of honest opinion."

And thereupon, with great profundity, our religious editor adds this: "There is a breath of fresh air badly needed in the medical profession, as well as in other groups, including the church."

Where there's smoke, there's usually fire also, and despite Dr. Means' excuses to the A. M. A., the newspaper reports must be at least fairly accurate. Dr. Kerr, new President of that College, also unburdened his thoughts against the national organization and the Chicago headquarters. Swan songs were added by Drs. Peters of Yale University, and Parran, salaried official of the U. S. P. H. Service, the latter stating quite clearly that medical practice is not up to full efficiency, and that the people are beginning to demand a minimum of health protection as a right.

The American Medical Association, in an effort to present to the public a comprehensive statement regarding medical practice, the care of the sick, and an opinion concerning the apparent desire of some governmental agencies to regiment the doctors, has issued and distributed to all state medical associations the two below-named pamphlets, with their accompanying sheets for required data, viz.:

1. Study and Provisions of Medical Care; Outline of Suggestions.
2. Conduct of a Study of Medical Care; Suggestions for committees.

Several copies each have been sent to the secretaries of all local medical societies, with request that such organizations—

- (a) Study carefully that literature.
- (b) Obtain from sources indicated, all data requested therein.
- (c) Retain data in Society's local files. Transmit duplicates to the A. M. A. headquarters for compilation, analyses, and reconsideration through all state medical associations, and finally the completed statement to the public.

Therefore, the question before you is—to what extent, if any, the local societies are interested enough to coöperate with the A. M. A.

Dr. W. F. Braasch of Rochester, Minnesota, as a member of the national advisory committee of the A. M. A. on Medical Supply, writes us expressing his willingness to help us in any way possible to carry out this national survey. He states that in Minnesota they already have had Dr. Leland, Director of the A. M. A. Bureau of Medical Economics, meet with them; that their Committee on Medical Economics has a sub-committee of fifty; that a designated committee will meet with the governor and other officials of that state; for exchange of views. Dr. Braasch advises that coördination of the various activities is carried on through the office of their state secretary.

The A. M. A. transmits to us a copy of a letter from Governor Murphy of Michigan to President Cook of the Michigan State Medical Society, offering the State's coöperation in this proposed survey. At the same time the A. M. A. notifies us that the medical organization in each state may properly arrange conference with the governor.

The Farm Security Administration and the Physicians: Your Committee on Medical Economics will now advise you fully about this emergency measure and its results during the past year. Were it not for the financial assistance afforded through such federal and state agencies, many thousands of North Dakota families would have been without subsistence of any kind. Under this emergency plan, the physicians also were enabled to get compensation for medical care of these indigents, which money otherwise most probably would never have come to the doctors.

To those committeemen who were called upon to assist in our association's problems, and who gave freely of their time and experiences, many thanks.

Respectfully submitted,
ALBERT W. SKELSEY, M.D.,
Secretary.

President Goss: You have heard the report of the secretary. What will you do with it?

Dr. NACHTWEY: I move the adoption of the report.

Dr. CRAWFORD: Second the motion.

Dr. WILLIAMSON: The secretary gave a very fine report and it contained many things of value. As I listened to this report, the thought occurred to me that we have been in the habit in the past of accepting the report, adopting it, and possibly referring it to a committee to do as they please with it.

Then we do not hear anything more of it until it is printed in THE JOURNAL-LANCET. I wonder if the men here would not like to say something on some of the points Secretary Skelsey has brought out, which might be helpful to the committee.

Dr. CRAWFORD: I think at this meeting here the Committee on Venereal Diseases is of greater importance to the medical profession than all of the other problems put together. There are certain things pertaining thereto that should be taken up and some definite action taken.

We hear much of the so-called high cost of medical care, etc. We know this, that you can't go to any respectable hotel and buy food and lodging for two dollars a day. Yet at the present writing, the Welfare and other set-ups hand over to the hospital two dollars for taking care of the indigents.

In addition to that, the National Security Act is becoming a great burden. For instance, I know of a small hospital which, with the National Security Act plus compensation, alone has taxes of \$500 a year. Now we let these things drift along and don't do a thing. Dr. Skelsey's report is a masterpiece, but we let it go by moving the report be adopted. It is up to us to discuss these things and see what the need is.

When it comes to these set-ups, we will take for instance, the cost of the administration. In a few months in some of the small counties, \$1,000 a month is allocated for medical care plus other things to the indigent, such as supplies, etc. The overhead of such administration is \$500 a month. In other words, to distribute one dollar of relief, it costs fifty cents—one dollar out of every two goes for overhead. And when it comes to cuts, do any of the boards cut their salaries? They do not, but the all-suffering medical man takes it in the neck as usual because he hasn't guts enough to stand up for his rights.

We have a bunch of chiselers who have brought some of these things about; for illustration, a hospital can't function on two dollars a day, so what do they do? They do everything imaginable even in an ordinary acute case of appendicitis: Wassermann, and every other thing in order to make the indigent's bills come up to somewhere near where they can exist. I say that we should here and now pledge ourselves that we want a proper fee for hospitalization of these indigents, WPA workers and FMAC workers and others so that the hospitals will not have to resort to practices which we know are just a little reprehensible.

Another thing we must recognize is that we have among our profession, fellows who pad their bills and all the rest of it. The honest straight-forward fellows whose bills are honest and legitimate are militated against right along. Now that is a proposition that is hard to regulate.

I am reliably informed that we will have funds for the treatment of syphilis and venereal disease available shortly, and that has to be threshed out here, and in the committee of which Dr. Frank Darrow is chairman; so we will be prepared to function when these funds are available, and not have them doled out here and there so some of the lay societies grab them.

Dr. RAMSTAD: May I inquire if the president has appointed a committee to consider these reports, to save a lot of time?

President Goss: I will name it at the noon hour.

Dr. WILLIAMSON: I move then that the secretary's report be adopted and referred to the Committee on Economics and bring in a report together.

Dr. BRANDES: The Committee on Economics is willing to work, but if we are to consider everything in the secretary's report, we will be here for a month. We are willing to take those things that pertain to the Committee on Economics, but there are lots of other things in his report besides that.

President Goss: A motion has been made and seconded to accept Dr. Skelsey's report. (*Motion put and carried.*)

May we hear the chairman of the Council's report?

Dr. RAMSTAD: The chairman of the Council would prefer to make his report later, after the Council has met, if this meets with your approval.

President Goss: All right. The report of the treasurer. (Dr. W. W. Wood, treasurer, gave his report, which report was referred to the Auditing Committee.)

We will now hear the reports of the Councillors.

REPORTS OF COUNCILLORS

First District

Since the last meeting of the North Dakota State Medical Association, the Cass County Medical Society has held seven regular meetings with an average attendance of thirty-eight.

We have a total regular membership of 69; associate membership of 4; transferred to other societies 2; lost by death, one; new members admitted, 6.

All scientific programs except two were put on by members of the society, chiefly in the form of symposiums. The subjects covered were as follows: discussion of certain new drugs, serum treatment of pneumonia, surgical treatment of tuberculosis, infected abortion, placenta previa, premature separation of the placenta, ectopic pregnancy, post partum hemorrhage, appendicitis in children, skin diseases common to children, diet in the treatment of children, surgery in childhood, plastic surgery in childhood, immunization procedures, malignant melanoma, bi-lateral glioma of the retina, petrositis, fistula and complications of mastoiditis, and a simple method of correcting ptosis of the upper eye lid. Lantern demonstrations were used freely for illustrations of many of the subjects.

A fee schedule for venereal disease treatment of those clients approved by the Welfare Board was worked out in committee, submitted to the local Welfare Board, and approved by the Board. There has been no report submitted to the society by the Welfare Board, covering this type of disbursement to the various members of the society for venereal disease treatment.

In the main, the Cass County Welfare Board still operates under the old system, long in vogue in Cass County, of supplying medical care to the indigent and those on relief in Fargo, by two physicians, hired at a nominal salary by the Cass County Commissioners. One of these physicians is a member of the society and the other is not. It is the general impression that the Farmers Mutual Aid Corporation has been of little or no benefit financially, to the members of our society living in Fargo, and that that portion of the population employed by the WPA is so poorly paid that medical fees are notably scarce when service is furnished them by the private physician. Just how the greater portion of medical service is supplied to the WPA workers is not clear, but it is assumed that it is supplied through the Welfare Service or through the Veterans Bureau Facility, and to a limited extent by the family physician. Certainly there is a considerable loss of patronage to the private physician even though he operates at very moderate fee rates.

The Committee on Radio has been active. WDAY has furnished time for broadcasts, some of which were in the form of episodes, depicting health problems and some in the form of talks by various members of the Society. A series of broadcasts on syphilis is being arranged for by the Committee during the coming summer and fall.

Referring to the system of medical service to the indigent and relief clients in operation in Cass County, and especially in Fargo, it is the consensus of the Cass County Medical Society that it has been placed and kept in an unfair position as compared with many of the component units of the state association. We believe that many physicians in other parts of the state have been and now are receiving fair rewards for service to those in distress, through working arrangements with their respective Welfare Boards, but that we have been the victims of discrimination too long. This should be a challenge to the state association to take some action to iron out such irregularities, wherever they exist, and to make a fight to perfect a uniform system, fair to all alike.

MURDOCK MACGREGOR, M.D.,
Councillor.

Dr. BENSON: May I ask Dr. MacGregor what proportion, who are treated by those two county physicians, and what class of patients?

Dr. MACGREGOR: The indigent are supposed to get all their care. The WPA is supposed to pay his own way but he can't.

Dr. SORENSON: I would like to ask Dr. MacGregor if there is a great deal of work for relief people on WPA work who can't pay their own bills. The reason I ask the question particularly is that we are held up, I wouldn't say to ridicule, but are commented on quite freely by the Welfare Board because

of the amount of money spent for relief of the indigent. It is so arranged that a lot of these WPA workers receive aid through the Welfare Board and this arrangement in Cass County is being continually referred to, about the small amount required in Cass County and the large amount in Ward.

President Goss: Does any one want to refer this to a committee?

Secretary SKELSEY: In regard to Dr. Sorenson's remarks, they are very well taken. I have seen that item running through the newspapers, and the trouble is that for about \$4,000 a year, a few contract doctors in Cass County are supposedly taking care of all the indigents.

Dr. SORENSON: They are attempting and have attempted to install the same system in the western counties that they have in some eastern counties. The reason they have not been able to do it in the western counties is that the doctors have united on this, and have agreed that no one will take the job as county contract physician.

Secretary SKELSEY: In Cass County about ninety-five per cent have agreed with the medical society and the other five per cent are for the old style contract practice.

Dr. MACGREGOR: You will recall our society in Cass County got together and everybody agreed not to take those jobs; but in twenty-four hours, some of them were out trying to get the job. The head man agreed if everybody would sign up he too would quit. He knew if they didn't all stick together, some few would take contract work, and that is what happened. Dr. Limburg, you might tell them what you know about this.

Dr. LIMBURG: I didn't know you were going to ask me to talk, but I might say it was about ten years ago when I had the work in Fargo and Cass County. We didn't have the indigents then that we do at the present time, or we would not have been so much concerned about doing it. It didn't make quite so much difference then. Now I looked this thing up, and if there is a lawyer here, he would probably know more about it than I do. However, there is a statute in this state that absolutely states the county commissioners must appoint a county physician in every county in the state, and when the matter comes up of appointing these county physicians, if the good reliable physicians of the county don't care to accept those appointments, we know we have a large number of scalawags in our profession, and they will give those appointments to those scalawags. So I think that is the one thing that has upset this matter probably more in Cass County, or in any other county where they have a county physician. I believe Fargo in Cass County is the only county in the state that has a county hospital and the indigents throughout the county are brought to Fargo for care. While I am heartily in favor of doing away with this contract practice, as you may call it, by the city or county physician, I don't know how you are going to get around this matter of the statute, which requires that county commissioners appoint a county physician. I think that is all I have to say.

Dr. LONG: One of the county commissioners expressed himself to some one who said, "How long are you going to keep up this system of hiring a county physician?" by replying, "Just as long as you fellows are damn fool enough to do it."

Dr. MACGREGOR: Doctor you used the word "scalawag". They are very fine men, but they realize if they drop out some one else will take it. The scalawags referred to does not mean or refer to the present incumbents.

Dr. LIMBURG: I am very glad you mentioned that. Dr. _____ is a very dear friend of mine and I don't want to infer anything of that kind to him. You understand about Dr. _____ and others, their appointments were made before ever this present matter of contract practice was brought up. I wouldn't in the world say anything about Dr. _____ or any of the doctors in Fargo. What I meant to infer was—I am Dutch so don't take me for what I say but what I mean.

I know there was a matter which came up in Cass County about the district physician. The physicians all got together there and said, "We are not going to take any townships at so much a township, and take care of the indigents." And what happened? Two fellows who have no standing, who didn't

belong to our society, one at Casselton and one in the southern part of the county, immediately took the position. They went right in and said, "We will take those jobs," and there you are. I think the county commissioners are up against a serious proposition, according to the statute, which requires that they appoint a county physician. As long as they do that, they don't care how good they are or who it shall be; but if they appoint scalawags, such fellows don't give those indigents the right kind of service,—they don't know how to give it in the first place. I want to again say I make no reference to the present incumbents.

Dr. MCCANNEL: I would like to say a word in regard to the contention of Dr. Limburg about county physicians. That is not the law, as I understand it. We had that very thoroughly threshed out at the time we were inaugurating the state welfare board. It is true county commissioners are responsible for the care of the poor in their respective districts, but there is nothing designated in the law that a county physician shall be appointed. That is the point the county welfare board had in mind when setting up the medical set-up. They had in mind that there is no way to compel respective counties to adopt the set-up adopted at that time. The only thing that can be used in arguing with them, is moral persuasion. The one whip we had over the county commissioners in lining them up, was the fact that we did not allocate money to the counties along other lines unless they conformed to the program that was practically the same as far as the medical set-up was concerned.

Dr. SORENSON: I think what Dr. Limburg had in mind was the county health officer.

Dr. LIMBURG: I am positive I am correct. If I bring over the code this afternoon, I will show you the section where it says that county commissioners must appoint county physicians each year.

Dr. BENSON: We grant that they do have it, but let me suggest this—why not bring some pressure to bear in this county to have them cut salaries so low that no one would take it, not even a scalawag.

President Goss: We will refer this report to the reference committee, or some other committee later on.

Second District

(In the absence of Dr. G. F. Drew, the following report was read by Secretary Skelsey:)

The Devils Lake District Medical Society held three meetings during 1937, all in Devils Lake.

At each meeting we had outside speakers, all programs were well attended, and the meetings were considered very successful.

We have taken one new member and lost one by removal to Grand Forks District.

We have had no friction of any kind and think our society is in good condition.

G. F. DREW, M.D.,

Councillor

Third District

Doctor MacGregor said the things that I would have liked to say in my report. There is no use in repeating them so I shall make mine short.

There are 68 licensed physicians in this district; of this number 53 have paid their membership fees.

There are six men in this district who have practiced here for more than fifty years. Some are not active and have not paid any membership fee, leaving nine who thus far do not seem to be interested.

I would suggest that the House of Delegates give some consideration to men who have been practicing in this state for fifty years. When we think of conditions at that time, the hardships they endured, the service they rendered the pioneers, and the standard they set for the practice of medicine of today, we must not be unmindful of the splendid things they have accomplished.

During the past year the profession has been active and coöperative, good monthly programs having been given.

I suggest again a re-arrangement of Councillor Districts. The north half of the state offers no problem. Four Councillor Districts arranged along trunk line automobile roads should be

satisfactory. To satisfy any individual preference, a similar arrangement as is in operation now could remain in force.

We have lost by death from this district during the past year Dr. Thomas Mulligan of Grand Forks, a past president of this association, well known to all. His passing was a distinct loss to the profession of this district. Also, we have lost Dr. Amos A. Flaten of Edinburg, a past superintendent of the State Board of Health. Dr. Flaten was one of the earlier practitioners licensed in territorial days, beloved in his community, where he served long and faithfully.

G. M. WILLIAMSON, M.D.,
Councillor

Dr. LIEBELER: I would like to make a motion that the House of Delegates recommend to the general assembly that these men in the State of North Dakota who have practiced medicine for a period of fifty years, or longer, be accepted as life members in the state association, and avoid further dues.

Dr. FAWCETT: Second the motion.

Dr. WILLIAMSON: That is something to which we should give a little serious consideration. I could look up and give you a list of all the men who have practiced here fifty years or more. I just cited those men from our district. Possibly a majority of those men at the present time are unable to pay, are not in practice, and it might be an honor to be a life member of this association. Of course, it would have to be without dues and it would have to be on recommendation of this House of Delegates. I would recommend to the Board of Medical Examiners to not collect any dues from those men. Fifty years is a long time for a man to practice. Dr. Grassick is the only honorary life member in the state that I know of who is carried on the books without dues. He was made an honorary life member of the state association on account of the splendid work he did in furnishing the history of medicine in North Dakota.

If you are not ready to pass on that now, just think it over and bring up the motion of Doctor Liebler a little later. I don't want the House to take any hasty action, but if you could be thinking it over in a sympathetic manner, it could be postponed and brought on at the next session.

Dr. Goss duly put the motion, which was unanimously carried.

Fourth District

The Northwest District Medical Society is composed of 61 paid members.

Nine regular meetings were held during the year, and one special meeting. Interesting programs were arranged for practically all the meetings. At one of them Dr. Irvine McQuarrie of the University of Minnesota, Department of Pediatrics, gave a talk on "Convulsive Disorders of Childhood." At three other meetings, films were shown of surgical procedures, and also the Board of Health film on the treatment of syphilis. One meeting was given over to the discussion of group hospitalization, as it would affect both the hospitals and practicing physicians; and one meeting devoted to the discussion of the care of indigents.

Seven new members were admitted to membership.

As regards the care of indigents, the spirit of cooperation amongst the doctors has this year been especially fine. All members have felt that there must be such cooperation and care in the handling of these cases, unless some system more obnoxious than the present be forced upon us.

When the subject of group hospitalization was presented before lay people, it was done by some one who was not connected with the profession, and with the idea that there would be no thought on the part of the people that it was connected with the practice of medicine, or that it was the beginning of socialized medicine. One or two of the more radical members of the audience stated that he believed group hospitalization would be the solution of a lot of ills, but that he also was much in favor of the plan being carried out so that it might include the cost of medical care. However, it is quite gratifying to know that his suggestions were not very well received, and that there were lay members present who could explain quite thoroughly why such a thing could not be done.

Although practically all of the doctors residing within the confines of our district are members of our society, there are

still many who never attend meetings. Diligent efforts are made each month to get these persons to attend, but with very little success. If any one has any suggestions whereby stimulation of interest in medical meetings could be created in these people, it would be gladly received.

A. R. SORENSON, M.D.,
Councillor

Fifth District

(In the absence of Dr. Wicks, the report was read by Secretary Skelsey).

The Traill-Steele County Society has a membership of nine, every eligible man a member.

Three meetings have been held with an average attendance of seven. Two guest speakers have appeared, and at each meeting local men have taken part in discussion. Professional harmony prevails, the only debate being in regard to fees.

The officers are as follows: President, Dr. A. A. Kjelland, Hatton; vice-president, Dr. C. A. Hjelle, Portland; secretary-treasurer, Dr. Syver Vinje, Hillsboro; delegate, Dr. W. H. Cuthbert, Hillsboro; alternate, Dr. Syver Vinje, Hillsboro.

The Sheyenne Valley Medical Society has a membership of thirteen; sixteen doctors practice in the territory, eleven in Valley City.

Nine meetings have been called, mostly for the discussion of local situation, economics, the examination of college students and public health activities. Present officers are:

President, Dr. C. A. Platou, Valley City; vice-president, Dr. A. W. MacDonald, Valley City; secretary-treasurer, Dr. Will H. Moore, Valley City; delegate, Dr. Will H. Moore, Valley City; alternate, Dr. A. W. MacDonald, Valley City.

F. L. WICKS, M.D.,
Councillor

Sixth District

During the past year our society has held three regular meetings. On account of the meeting of the State Medical Association with us, a fourth meeting was not deemed advisable.

At present we have 63 members in good standing.

The new members admitted during the year are: Dr. R. F. Nuessle, Bismarck; Dr. Ralph Vinje, Bismarck; Dr. H. A. Wheeler, Mandan; Dr. Theodore Stransky, Mandan; Dr. August C. Orr, Bismarck; Dr. Harriet Bixby, Bismarck.

We have lost two members during the year: Dr. E. E. Hamilton has moved from New Leipzig to Indiana; Dr. W. G. Rogne of McClusky has located in Minnesota.

There were no deaths during the year.

The out-of-town speakers at our meetings were Dr. Frank Darrow of Fargo who spoke to us on "The Syphilis Problem from the Standpoint of the Physician," and Dr. Harry Fortin of Fargo who read a paper on "The Diagnosis and Treatment of Low Back Pain and Related Back Conditions."

The present officers of our Society are: Dr. O. C. Gaebe, New Salem, president; Dr. G. R. Lipp, Bismarck, vice-president; Dr. L. W. Larson, Bismarck, secretary-treasurer.

N. O. RAMSTAD, M.D.,
Councillor

Seventh District

Our society numbers twenty-one members in good standing. Two additional members not included have not as yet paid their dues. During the year we lost four members by transfer. Only one of these remained in the state. During the year we were unfortunate to lose one of our younger members of the society, Doctor Cabot, his death occurring late in the fall.

We have taken in five new members during the year, only one coming from without the state.

Our society's year has been very successful. Six regular meetings were held; five of these were scientific and one entirely business. Our average attendance has been very good, numbering twenty-two. In this number are included many visitors from Carrington, Valley City, Edgeley, Kulm, and other nearby cities.

We have been particularly fortunate in having outside speakers, men of recognized ability, present papers. At the scientific meetings our speakers have been: Dr. R. E. Pray, Fargo—"Hyperinsulinism"; Dr. Kepler, Rochester—"Treatment

of Diabetes Mellitus with Protamine Insulin"; Dr. J. Moore, Grand Forks—"Management of Abortion"; Dr. Henry Michelson, Minneapolis—"Skin Diseases in Relation to General Practice"; Dr. John Waught, Rochester—"Treatment of Pelvic Tumors."

During all of these meetings we have had in addition to the regular speakers two or three films on various medical subjects.

The officers for the year 1938 are: Dr. W. H. Longstreth, Kensal, president; Dr. R. D. Nierling, Jamestown, vice-president; Dr. B. B. Brainard, Jamestown, secretary-treasurer.

As before stated, our meetings have been very successful and the attendance has been very good, possibly influenced by the fact that we have been fortunate in having good papers presented and also possibly due to the fact that we find we have more interest and better attendance if the meetings are preceded by a dinner. The society is in very good shape financially, owes no bills, and has a little balance in the bank. Most commendable is the feeling of good fellowship that prevails in the community.

P. G. ARZT, M.D.,
Councillor

Eighth District

The Southern District Medical Society held three meetings during the past year with an average of ten members present.

At the present time, there are twelve paid up members and four doctors in the district who are eligible for membership, but have failed to pay their dues for the coming year. We have two new men who have located in the district. They are members of the local society. One member was lost by death, namely, Dr. E. H. Emanuel of Milnor.

At the last meeting of the Southern District Medical Society held April 27th, all members present went on record as being much opposed to the present set-up with the North Dakota Farmers Mutual Aid Corporation.

F. W. FERGUSSON, M.D.,
Councillor

Secretary SKELSEY: In connection with Dr. Fergusson's report, I received a communication which I suppose should be read here, from the secretary of the Southern District Medical Society, wherein they sent a protest to the Medical Economics Committee, as follows:

"At a meeting of the Southern District Medical Society held at Ellendale on April 27th, the following resolution was presented and adopted:

"Whereas, the Farmers Mutual Aid Corporation, in a recent announcement, has declared a reduction of 20 per cent in fees for the month of March, 1938; and

"Whereas, the schedule of rates formerly fixed by the FMAC was considerably below the regular medical fee schedule, and a further reduction works a hardship upon the profession; now, therefore,

"Be it resolved, that this organization assembled at Ellendale, North Dakota, on April 27, 1938, most emphatically condemns and protests this action.

Respectfully submitted,
SOUTHERN DISTRICT MEDICAL SOCIETY,
by ROY LYNDE, M.D., Secretary."

President GOSS: Should this be referred to the Committee on Medical Economics?

Dr. FAWCETT: I so move you.

Dr. MACGREGOR: Second the motion. (Motion was duly put and carried unanimously).

Ninth District

Dr. MACLACHLAN: Dr. Owen of New Rockford is the regular delegate from the district and Doctor Matthaei of Fessenden is alternate. Neither gentleman is here. Dr. Owen intended to be here but the last moment was detained and asked that I attend this meeting of the House of Delegates and represent the society. I have no written report, but I might state at this time that we have lost one member of the society in the last year, Dr. Roy McKenzie, who died about two months ago. Later the regular delegate will hand in a report.

(Following report handed in by Dr. D. W. Matthaei, acting for Dr. John Crawford.)

The Tri-County Medical Society met four times during the last year. The most common topic of discussion was medical economics, but many interesting clinical cases were presented and discussed.

The membership is twelve, one member having transferred to another society, and another having relocated among us. A former member, Dr. J. Roy McKenzie passed away.

During the previous year our society voted to disband and it was thought that the members would join neighboring societies. Only one did so and upon reconsideration it was decided to keep our little family intact by a unanimous vote.

Tenth District

As Councillor for the Tenth District, I beg to submit the following report:

We have twenty-six active members in good standing this year. Dr. G. A. Perkins and Dr. B. H. Museus of Dickinson, both of whom have retired from active practice, have been elected honorary members of the society. Dr. Virgil Parrett of Beach has applied for membership but his application has not yet been acted upon. President for the year is Dr. F. J. Cornelius of Bowman and vice-president is Dr. R. W. Rodgers of Dickinson.

During the past year we have lost the following members: Dr. W. C. Bradley of Beach is now located at Jamestown and has transferred to the local society; Dr. M. F. Williams, formerly of Hettinger, has now located at Linton and has transferred to the Sixth District.

We have held four meetings which have been well attended and very much enjoyed. At the last meeting a committee was appointed to have charge of the survey being made by the A. M. A. on the "Need and Supply of Medical Care."

All told, we have had a very successful, profitable and pleasant year.

A. E. SPEAR, M.D.,
Councillor

REPORTS OF STANDING COMMITTEES

Dr. L. W. Larson, Chairman of the Committee on Public Policy and Legislation, gave an oral report and a written report which was referred to the Reference Committee.

Committee on Medical Education

(In the absence of the chairman, Dr. H. E. French, Secretary Skelsey read the following report.)

Your Committee on Education would report as follows:

Throughout the year all members of the committee have been in frequent contact by correspondence and most of the members by frequent conferences.

The chairman of the committee and Dr. W. C. Fawcett appeared before the Council on Education of the American Medical Association at the Atlantic City meeting in June, 1937. The council authorized the school to admit a beginning class in the fall of 1937, and later to admit a class in the fall of 1938, without prejudice and with the assurance that credits secured at the school should receive full recognition.

The chairman attended the meeting of the Association of American Medical Colleges at San Francisco in October upon solicitation that the school apply for reinstatement in that organization on probation. The action of that body, however, was to receive the application and to defer decision until after an inspection to be made in the spring of 1938. Dr. F. C. Zapffe, secretary of the association, and Dr. A. C. Bachmeyer, associate dean of the division of biological sciences at the University of Chicago, and also a member of the executive council of the Association of American Medical Colleges, visited the school on April 28 and 29. No report has yet been received.

In the meantime the faculty of the school has been strengthened by the adding of two new men in the fall of 1937, and a third recently chosen to come in the fall of 1938. The library has been strengthened considerably and the salary scale and budgets for supplies and equipment have been increased moderately.

In the meantime, too, the work of the school has continued on the general plan that is well known to you. All members of the class who finished the two year curriculum in June, 1937,

were able to secure advanced standing elsewhere and are continuing their training. Twenty-four of a beginning class of twenty-seven entering in September, 1936, are now finishing the curriculum. Most of them (19) have already been admitted to other schools for the work of the clinical years. A beginning class of twenty-four was admitted in September, 1937, and now numbers twenty-two. As an indication of the success of the efforts of the school, it can be said that five men of the class to finish last June elected to write upon Part I of the National Board examination. All passed and two made averages that placed them in the group of the highest ten out of over eight hundred writing in June, or four hundred writing in September.

The school may well take satisfaction in the performance of its former students. Its handicaps growing out of inadequate support are, of course, granted. If the school is ever to meet the full approval of outside rating bodies, it can only be after better provision has been made for housing, salaries and all items of equipment.

Dr. W. C. FAWCETT: I have not much to add to what Dr. French has stated in his annual report. The Council on Education of the American Medical Association were very courteous and gave us, I think, plenty of time to state our side of the situation as it pertained to our medical school. The main points that had to do with the school were about as follows: We had to have more room, or better still a separate building; in fact, a separate building will have to come sooner or later. The library ought to be in a separate room, definitely set apart for that alone. Then there should be one person to look after the library. The faculty should be increased by at least three persons. This now is being attended to, so that the college will have the extra men this fall for the classes of 1938 and 1939. Again, the salary scale is much too low. It must be materially increased, so that the positions which may open up from time to time on the faculty will attract men from the larger centres who might be looking for teaching positions in a medical school.

Our medical school will continue to operate providing that we in North Dakota see that the many improvements suggested are forthcoming, and that very soon.

When the Committee on the American Medical Colleges were at our medical school, this April, inspecting the college, I had the pleasure of meeting with them at luncheon. They, like the other committee earlier on an inspection trip, seemed very anxious to help us work out ways and means to improve the college. They too were very insistent that the college must make the improvements suggested, if we hope to continue as a Class A school.

My opinion is that if we, as physicians of North Dakota, get behind our medical school and give it our united support, it will be credited both by the Committee on Education of the American Medical Association as well as by the Association of American Medical Colleges.

Secretary SKELSEY: Dr. Grassick, the chairman of the Committee on Necrology, sent to Dr. Williamson a rather incomplete obituary for the simple reason he had not information regarding the several lately deceased members. I have sent out inquiries to the relatives and hope to have that in time for Dr. Grassick when he returns. The whole list will be completed and go into the transactions. I think, however, it would be appropriate first to read something truly Grassick, the opening paragraphs of his obituary; then read the names of the fourteen people of whom we have record of having died. If any of the members know any names not included herein, kindly advise me later. (Secretary Skelsey read the opening paragraph and the names included in Dr. Grassick's report.)

President Goss: I will appoint on the Reference Committee: Doctors Ramstad, Williamson, MacGregor, Bowen and Brandeis.

We will adjourn until two o'clock.

SECOND MEETING HOUSE OF DELEGATES

The adjourned meeting of the House of Delegates was called to order at 2:00 P. M., on May 16, 1938, by President Goss.

Secretary Skelsey called the roll with the following members present:

Doctors:

Murdock MacGregor, Fargo
G. M. Williamson, Grand Forks
A. R. Sorenson, Minot
N. O. Ramstad, Bismarck
P. G. Arzt, Jamestown
F. W. Fergusson, Kulm
John Crawford, New Rockford
A. E. Spear, Dickinson
A. M. Limburg, Fargo
J. C. Swanson, Fargo
George Foster, Fargo
A. M. Call, Rugby
C. J. Glaspel, Grafton
W. A. Liebeler, Grand Forks
E. J. Beithon, Hankinson
Will H. Moore, Valley City
R. H. Waldschmidt, Bismarck
O. T. Benson, Glen Ullin
C. H. Sherman, Oakes
A. P. Nachtwey, Dickinson
F. O. Woodward, Jamestown
Syver Vinje, Hillsboro
W. H. Long, Fargo.

A quorum was declared present, and the following proceedings were had:

President Goss: The Reference Committee has been changed somewhat and as it now stands it is composed of the following: Dr. Nachtwey, chairman; Drs. McCannel, Long, Waldschmidt and Woutat.

The Executive Committee is the next on the list. The president is the chairman; however, Dr. Skelsey is the secretary and the president has the power to ask him to give the report, so will you please do so.

Executive Committee

Dr. SKELSEY: The Executive Committee was called upon principally by the Committee on Economics, and also asked to draw up a protest against U. S. Senator Lewis's bill for regimentation of doctors. Such protest was drawn up and sent, as I stated this morning, to our congressional representatives, who acknowledged receipt of our communication. Senator Lewis of Illinois and Franklin Roosevelt did not reply.

The main meetings of the Committee on Economics were called by Dr. Brandes. Various conferences were held and he as chairman can report on that. The members of various committees were very obliging and came to the meetings at Bismarck, even in bad weather, for which we wish to thank them.

So far as I know, this constitutes the report of the Executive Committee.

Dr. Goss: Is Dr. Brandes ready to report? If not, we will call for the report of the Committee on Medical History.

Dr. WILLIAMSON: I haven't any report. We do have a number of books on hand and there are a lot of the younger fellows who haven't bought any of them. Dr. Skelsey probably has a bunch of books with him and you can purchase them. Dr. Grassick has considerable more data that might come out later on. We might put out a second volume and bring it up to date. It is very important if any of you men haven't the history that Dr. Grassick wrote, that you communicate with Dr. Skelsey and purchase one of these books. I think if we can get \$1.25 for them, we should accept it.

Secretary SKELSEY: I am trying to sell Dr. Grassick's book. The older members have bought it and the younger men apparently don't care about it. Last year I mentioned the book, and then a very clever fellow down at THE JOURNAL-LANCET asked for a copy of it and I sent it to him. He wrote a special review and stated the book could be purchased for \$2.75, but we didn't get a single request from doctors; however, I have them if you want a copy.

President Goss: The Committee on Permanent History.
 Secretary SKELSEY: Dr. Grassick is in California.
 President Goss: The Committee on Public Health, Dr. Maysil Williams, chairman.

Secretary SKELSEY: She is busy in another meeting.
 President Goss: Report of the Editorial Committee on THE JOURNAL-LANCET?

Secretary SKELSEY: That has been handed to me. I have not yet looked it over but will read it to you. Dr. Arnson is the chairman.

Committee on THE JOURNAL-LANCET

The Committee on THE JOURNAL-LANCET submits the following report:

The relationship with THE JOURNAL-LANCET has been satisfactory and cordial. The committee feels that the present arrangement with the magazine should be continued. It does not have in mind any suggestions for changes of policy for the coming year. However, it would welcome any suggestions from the members of the society.

Dr. WILLIAMSON: I move the adoption of the report. (Several seconds were heard; the motion was duly put and unanimously carried.)

President Goss: The Committee on Cancer Survey in North Dakota, Dr. L. W. Larson, chairman. He is not present.

May we hear from the Committee on Tuberculosis?

Dr. MACLACHLAN: Mr. President, we have been unable to get together since we arrived in Bismarck, and it seemed not practical for us to meet. We sent out an invitation but the result of the survey was that they wanted to meet here and we have been unable to get together here at this time, but we will, and then make a report at a later meeting.

I would like to ask the members of the Committee on Tuberculosis to meet me in this room, or at room 229, Grand Pacific Hotel, at the close of this meeting. The committee is composed of Drs. C. J. Glaspel, W. H. Long, M. W. Fawcett, F. O. Woodward and myself.

President Goss: The Committee on Fractures. I understood Dr. Campbell was to be here today.

Dr. WILLIAMSON: He will be, some time this afternoon.

President Goss: The Committee on Medical Economics, Dr. H. A. Brandes, chairman.

Committee on Medical Economics

Dr. H. A. Brandes, chairman of the committee, gave the following report:

This is the report of the Committee on Economics during last year, since our meeting in 1937.

During the past year the work of your committee has been chiefly directed against efforts to modify our Medical Relief Program and against the action of some of the County Welfare Boards to arbitrarily reduce medical fees. In this work we have not been altogether successful, as we shall point out in this report.

With the replacement of the Resettlement Administration by the Farm Security Administration the latter part of May, 1937, the North Dakota Farmers Mutual Aid Corporation became inactive on June 10, 1937. From that date until December 1st, 1937, the Public Welfare Board of North Dakota assumed responsibility for medical treatment to former Resettlement Administration clients.

Early in July, 1937, Dr. R. C. Williams, medical director of the Farm Security Administration, requested a conference with the executive and economics committees to consider plans for medical care and on July 29, 1937, a meeting was held in Bismarck with F.S.A. officials. At this conference were also representatives from the North Dakota State Dental Association and the North Dakota State Pharmaceutical Association.

We shall not attempt to report on the plans proposed by the F.S.A. or on the discussions at this and a subsequent meeting held October 31, 1937, but briefly state that after we agreed to two changes the F.S.A. finally accepted the plan which we had under the North Dakota Farmers Mutual Aid Corporation. Under the original program it was necessary for the client to obtain authorization from the County Welfare Board, but with the change we agreed to, the present plan provides that presentation to the physician of a membership card in the corporation entitles the client to medical attention in acute or emergent conditions.

This change, which we at first did not consider important, has resulted in the abuse of the program by the clients and in some instances by physicians and has been a contributing factor to the rapid rise in the cost of medical care to F.S.A. clients.

Owing to Federal regulations we were unsuccessful in our efforts to eliminate the clause in the new agreement which reads as follows:

"The North Dakota Farmers Mutual Aid Corporation will secure funds on the basis of \$1.00 per month per family of its membership for the purpose of paying for physicians' and surgeons' service; this amount to be divided into equal monthly allotments and bills for physicians' and surgeons' services will be paid monthly from the amount for a given month. In case the total bills for a given month are more than the amount allotted, each bill will be reduced in the necessary proportionate amount."

From our past experiences with Medical Relief the amount allocated on the basis of \$1.00 per month per family should have yielded a sufficient sum to cover the cost of medical service. However, we had not anticipated the increasing demand for care and a corresponding rise in medical costs brought about the change in procedure for authorization; as a result the March bills exceeded by approximately \$9,000 the amount allocated to the Corporation.

The committee was called to Bismarck on January 24, 1938, to meet with the Public Welfare Board to discuss the cost of medical care to County Welfare Board clients. At this conference we were informed that in several counties the cost per patient was far in excess of the charges in most counties and that it would be necessary to take immediate action to remedy the situation. After much discussion the Board decided to appoint a committee of three of their members to make a thorough study of medical and hospital costs. We requested that when the report is completed we be given an opportunity to study it before changes are made in the present program. We understand the report was recently filed with the Board but as yet we have no definite information on the contents or recommendations.

The Public Welfare Board of North Dakota recently made drastic reductions in relief expenditures because of shortage of general relief funds and this action will directly affect the physicians because 35 per cent to 40 per cent of all money available for general relief purposes is now spent for medical care.

Unless each physician is willing to make an honest effort to cooperate with relief officials to keep down medical costs, we will be confronted with a further reduction in fees or a return to the employment of one or more physicians in each county to serve relief clients.

To lower present fees or to return to the employment of county physicians will eventually lead to a lower standard of medical service to our people.

As physicians we must make greater efforts than we have in the past to bring this more forcibly to Welfare agencies and to our people to the end that sufficient funds be appropriated by the next Legislature to provide adequate medical care to the indigent. The care of the indigent is the responsibility of our welfare agencies and while we shall continue to give freely of our services to the deserving poor, it is unreasonable to expect physicians of our state to assume a still greater financial burden because of the depletion of relief funds.

Since I wrote this report, I received a letter from the same committee Dr. Skelsey mentioned this morning. Then too in this morning's mail I find there are several more counties that have decided to take upon themselves the matter of making up a fee schedule. Logan County has done that; they have assumed this responsibility themselves. They sat down and decided how much to give the doctors. We find in Benson County they have set up a new fee schedule something similar to the one gotten out by McLean County. Dickey County has done likewise, undercutting the state medical fee schedule. I don't know what you think about it, but I think there should be no further dropping of the fee schedule. If you start to reduce fees at this time, there is no telling where you will have to go. Mr. Wilson no doubt will tell you how much money they have to spend the next eighteen months. Since they spent about two and

a half millions in the last eight or nine months, they have about \$275,000 to go on until July 1st, 1939. You see where they are going to be unless they have an extra session of the Legislature to appropriate more money. Now what are we going to do about it? Personally I am opposed to any reduction in fees. Your pay patients will look at these county fees and wonder why they have to pay such large fees.

I think it is a matter for our economics committee to make recommendations in order to tell you just what we plan to do. A meeting is called for the economics committee and the members of the House of Delegates should get together and make some recommendations to us, and then we will bring it back to the next meeting of the House of Delegates so you men can pass on it, because we have to have the official action of the State Medical Association. We would like to have just a little expression from some of you men so we can be guided in our work in this committee meeting we are going to have at the close of the House of Delegates.

The expenses of the committee, excluding travel expense in the amount of \$91.95 of the members to the three meetings (July 29, 1937; Oct. 31, 1937; Jan. 24, 1938) held in Bismarck, during the year were as follows:

May, 1937, to May, 1938, stenographic fees	\$ 25.00
Nov. 26, 1937, stamped envelopes (Postmaster)	32.64
Nov. 27, 1937, stamps (Postmaster)	15.00
Nov. 27, 1937, mimeographing (Bismarck <i>Reminder</i>)	20.00
Nov. 29, 1937, imprinting envelopes (Bismarck <i>Tribune</i>)	2.30
Nov. 29, 1937, folding and mailing (Commercial <i>Service</i>)	5.50
Total	\$100.44

Secretary SKELSEY: Inasmuch as there is a definite sum allowed for the committee on economics, and vouchers are attached here, should this be turned over to the council in charge of these disbursements?

Dr. RAMSTAD: We will leave it to the council.

Dr. WOOD: I think that a big share of this trouble has come through lack of cooperation with the Welfare Board. I know of quite a number of instances where the Welfare Board sends patients to the doctor and passes the buck to him. The patient is given to understand that he can go and have the doctor take care of him. They don't stop to fill out the emergency cases like they did before. The patient will come in in an emergency case and will tell you he is not in line for the FMAC; yet inside of a week or ten days he will show up with a card, and I think that these two things are two of the principal causes of such a rise.

Dr. SHERMAN: I would like to ask Dr. Brandes what percentage of the relief money is spent in this state, (that is for the doctors). I don't mean everything that is classified under medical, some of which is not medical; for instance burial expense. In our own county I have been following the figures for about a year or more and the doctors themselves are getting just about ten per cent of all the money that is spent in that county for relief. If you cut the doctors' fees in half, how much are you saving? You will save five per cent of all the money sent in for relief. It seems to me there is something else wrong with this relief proposition other than the doctors' fees. If you will notice the amount of money paid out for the upkeep of the relief office, you will see it far exceeds what is paid out for medical relief. It was mentioned this morning that for every dollar spent, there is an equal amount spent to run other things. It is not all chargeable to medical relief. What good is it going to do to cut us another third or half. It will be negligible, the way it looks to me.

Considerable discussion ensued, concerning the medical relief situation in North Dakota, which was participated in by Doctors MacLachlan, McCannel, Limburg and Williamson.

Dr. WILLIAMSON: I move you that the committee bring in their supplemental report later on at one of the adjourned meetings.

Dr. LIMBURG: Second the motion. (Motion duly put and unanimously carried.)

Committee on Cancer Survey

Dr. L. W. Larson, chairman of the committee, presented the following report:

The activities of the committee on cancer during the past year have been confined to the promotion of the Women's Field Army of the American Society for the Control of Cancer. This Army, which is conducting a campaign now for memberships in the state, is under the direct control of our profession through its committee on cancer, which constitutes the executive committee of the Women's Field Army in North Dakota.

The executive committee determines the policy of the Women's Field Army and will control the expenditure of funds derived from the campaign. These funds may amount to quite a little money inasmuch as seventy per cent of each one dollar membership fee is retained by the state organization.

A meeting of the committee on cancer was held in Bismarck after representatives of the American Society for the Control of Cancer had met here with the committee chairman and had appointed Miss Laura Sanderson of Bismarck as state commander of the Field Army. At this meeting of the committee the campaign plans were outlined and every attempt is being made to promote the work throughout the state.

There is no doubt that the medical profession will derive much benefit from the work of the Women's Field Army. Women will be instructed in the early signs of cancer and will be urged to see their family physicians as soon as any of these signs appear. However, the members of our profession must become more cancer-minded so that they will be able to evaluate the signs and symptoms of early cancer and if they are not equipped to carry on an extensive study of their patients, will be willing to refer them to associates who have such facilities. You can rest assured that the women who become interested in this work will demand thorough examinations and will be very critical of their physicians. For this reason and in order that the Women's Field Army may be increased in size and importance in this state, the committee on cancer makes the following recommendations:

1. That the committee be continued as a permanent committee.
2. That the members of our state association give their support to the campaign of the Women's Field Army.
3. That every effort be made to instruct our membership in the early diagnosis of cancer.

Dr. WOOD: I move the adoption of the report.

Dr. McCANNELL: Second the motion.

Dr. LARSON: I might say that a number of physicians in response to a form letter I sent out about this sent contributions to me, and in each instance, I have turned the money over to the treasurer and also informed Miss Sanderson of the name so she could forward that name back to the local organization. You will therefore be given credit for the local contribution and I assure you we appreciate the response.

(Motion was duly put and unanimously carried.)

President Goss: The Committee on Maternal and Child Welfare.

Dr. LIEBELER: Dr. Moore asked me to give the report. He sent it on to Dr. Maysil Williams but she is at another meeting and I have been unable to get in touch with her, or she with me.

President Goss: The Committee on Crippled Children, Dr. A. R. Sorenson, chairman.

Dr. SORENSON: This committee is not at this time ready to make a formal report for this reason: There is considerable dissatisfaction among the surgeons of the state as to the method in which this program is being handled at the present time. Many of them feel that a good deal of this work could be retained at home and taken care of by surgeons who have had experience in taking care of crippled children, so I thought it would be well for us to have an expression from the men in this group as to recommendations that we might make to the Division of Child Welfare in regard to the care of crippled children. As I said before, there are a number of men who are dissatisfied with that, and I would ask the men who are interested to discuss it freely in order that a recommendation may be made. Dr. Swanson, also on this committee, has something to say on this.

Dr. WOOD: Well, I feel a good deal as Dr. Sorenson has stated, that the way the thing is conducted at the present time is very unfair. Very many men over the state also feel that to have it so centralized is not quite fair, and that perhaps ninety or ninety-five per cent of it could be just as well taken care of by the local surgeons and have that extra money that is going into the hospitals for those cases that are shipped out. This might just as well be retained in the local communities to help along the hospitals that need it, without any detriment to the crippled children. I think some action should be taken.

President GOSS: That is a good suggestion. If any of you gentlemen are interested, kindly speak.

Dr. SWANSON: Mr. President, as a member of that committee, and also probably being one of the principal beneficiaries of this crippled children's act, I would like to mention several things that probably should be considered in going over the program as set up in this state. We have met several times at Bismarck trying to arrive at a program to take care of our crippled children as efficiently as possible. Dr. Fortin and I, being orthopedic surgeons who have done the principal amount of this work are, of course, especially interested. The set-up as is now established is a set-up that is uniformly accepted throughout the United States. There are numerous restrictions in that program which make it impossible for a large amount of this work to be done locally; however, it is the objective of our work to decentralize just as much as possible. We hope to, and have tried to do as much of this work locally as could be done, and along that line we have tried to establish qualifications which are necessary in carrying out the program as set up under the crippled children's program which is formulated at Washington.

The principal requirement of orthopedic surgeons is that these surgeons have to be qualified by the American College of Orthopedic Surgery. We are glad to let any one do this work who can come up to those qualifications. That covers orthopedic work itself. The correction of congenital defects, the correction of club feet, and work of that type—previous to this last year you surgeons have not wanted to do that work. Prior to this time this work has not been done in the state. Most of it has been done through the Shriner's Hospital or through other orthopedic hospitals outside of the state. You know how conditions are in the Shriner's Hospital. They have a limited capacity, have a waiting list of the children here in the state for two or three years. Some of the children wanted to have this work done last year, so it was an unusually busy year. Several thousands of children have never received any attention until last year, and we tried to clear up the back-log as quickly as possible. That probably will not be repeated.

Fractures and acute conditions certainly should be done at home and we want that to be done there. If there are certain conditions which many of the surgeons hesitate or do not care to do, we can not turn them down when sent to us. The requirements of our program said we had to take care of those last year. Something like \$26,000 was assigned for surgeon's fees and of that amount Dr. Fortin and I received \$18,000. That was real work. None of that was finished orthopedic work. Ninety-nine per cent of that was for children who had had defects fifteen or twenty years. Something should have been done before that time and if it had been done, we would not have had the immense amount of work we did last year. We cleaned up a lot last year and every year from now on there will be a gradually reduced amount until it may be on a more stable basis. Probably one-fifth, or less than that amount of work will be done each year.

We do not want to hog this work. Dr. Fortin and I know there are surgeons in the state who can do this work as well as we can, but the qualifications are such in this program that much of it cannot be done locally. Whenever it can be done locally, it has been the consensus of our committee, and I think Dr. Brandes and Dr. McCannel will bear me out in this, whenever it can be done at home, we want it done there. We have surgeons on the roster of the American College of Surgeons to do this work locally, and whenever such a surgeon can see these cases and can be properly authorized, they can do that work; however, the federal set-up is such that strictly orthopedic work must be done by orthopedic surgeons who have been licensed

by the American College of Orthopedic Surgeons. That is the handicap which we have. Dr. Fortin and I made a special effort to be qualified by this Board and any of you gentlemen can be qualified.

Sometimes it has been too much of a load for us. Personally I would not care to do that amount of work again. It is too much for any one man. It became so strenuous that I had to take a vacation, the first time in my life that I have taken one in the winter time. I would say frankly that we want you all to do this work, if you can do it under our set-up.

Dr. BRANDES: Since my name has been brought into it, I want to tell you something about these committees. I think it was about a year ago I was appointed to the Committee on this Crippled Children's program by the State Welfare Board, or rather, the board under the Children's Bureau. You have to remember the Children's Bureau here is legally under the Board of Administration, but it functions under the Welfare Board; that is some of us think that is the way it happens, so your crippled children's program here, your children's bureau, this committee that Dr. Swanson talks about is not one of the committees of the North Dakota State Medical Association. We were appointed more or less as advisory committee to the crippled children's program, or crippled children's bureau.

I remember when we first met along in June last year when they were organizing this work. As Dr. Swanson mentioned, the Children's Bureau do set up the requirements in this program, and they do set high standards. You can see the reason for that, because if they did not, a lot of poor work would be done. They require that men who are members of the American Board of Orthopedics do this work. They also want consultants, and any medical consultant you have is supposed to be a member of the American Board of Internal Medicine. They require that the X-ray men be members of the Board of Radiologists, and they require that one who gives physiotherapy, must be a like member of the Board of Physiotherapists. They do set high standards, and I remember when we first met last year we saw no reason why much of this work should not go to the men nearest to the home of the patient, that is men qualified to do the work, and that was my understanding of it.

And then you remember there was a fee schedule that went with that. I sent that fee schedule and also asked at that time that a committee on crippled children meet. I will tell you where the whole trouble comes in—this is not a reflection upon the members of the committee, but a reflection upon the system under which we do business in the state association. We appoint committees and nothing happens. We make resolutions favoring certain things, and nothing happens. We need more business in this association if we are going to get any place, as I see it. That committee on crippled children has not met during the year, so how can you expect a program to be carried through if your committee didn't meet, or your executive committee act on it. This work is ready to go. Well, what happened? Dr. Fortin and Dr. Swanson took care of it. That is where the trouble comes in. When a committee is appointed, it has to get busy and work a jump ahead of the federal agencies on programs. If you don't, they will make it for you.

I want to be clear on this committee. I am not on the official committee of the state medical association but I did call attention to the president that there was supposed to be a meeting of the Crippled Children's Committee in Jamestown last summer. I asked several times if the fee schedule that was approved might be acted on some way by the executive committee. That fee schedule has been changed twice that I know of. I just bring that up to throw light on it. The committee, as I say, of the state medical association should have acted last July.

Dr. McCANNEL: I happen to be on that committee, too. As Harry said, the entire thought of the committee was to decentralize at that time. I think the vast amount of work done this year, which was brought out at the last meeting, is due to the fact that when these clinics were held over the state, a general feeling got into the minds of most of the people, that this was more of a temporary set-up and they had to rush the patients all in at one time, or the program might be discontinued, not realizing that this crippled children's program is

a permanent thing and will be here for some time under the Social Security Act. That accounts for the large amount of work which Dr. Fortin and Dr. Swanson did. I think, as Harry says, that by the Crippled Children's Committee coöperating with the advisory committee of the State Welfare Board and state association, we can iron these things out.

Dr. RUSSELL: Our program calls for specialists and the American Medical Association in coöperation with the different special societies has set up various boards. As you know, these boards qualify the men to do the type of work which they select. All you have to do in order to qualify is write to the secretary of the various boards stating your specialty. They will send you a questionnaire which you have to fill in stating the qualifications and the type of work you are doing. If you qualify and the board licenses you, then you come under the program as set up under our plan. It is very simple.

Dr. WOOD: What is the preliminary training?

Dr. SWANSON: On most of these boards the preliminary training is very strict. You have to take an examination to qualify under most of these boards. They set a regular period for that. The *Journal* of the American Medical Association carries a schedule of examinations. They usually are held in connection with some meetings. Our examinations are held in meetings of the American Orthopedic Association, the American Academy of Orthopedic Surgeons, and with the meetings of the A. M. A.

Dr. WOOD: Preliminary to the examination, what is required?

Dr. SWANSON: The Board requires that you have your usual schooling with your internship and three years of special study in orthopedic surgery before you can qualify in the American Board of Orthopedic Surgeons.

Dr. WILLIAMSON: Without casting any reflections on anybody who may be a member of the College of Surgeons, Orthopedic Surgeons, or anything else, the College of Surgeons was organized some years ago and they went out and combed the country from end to end. The trouble is there are too many trying to be specialists and that is the curse of medicine and surgery today. Everybody wants to be a specialist. The fellow who was fortunate enough to get in early could have been certified as an orthopedic surgeon, or a specialist in internal medicine. Your board is one of the older ones and rather strict but there should be some way of getting around this. I am in favor of those boards and I think from now on the fellows who get to be certified as orthopedic surgeons must have the qualifications. I am a member of the College of Surgeons and I never thought or never held myself up to be any better than a lot of you fellows. And I think there are a lot of you who got in the same way as I did.

President GOSS: What shall we do with the report?

Dr. SORENSON: This committee has not made a report. The formal report will be made later on.

President GOSS: The Committee on Public Health: Dr. Williams is here now.

Committee on Public Health

Dr. Maysil Williams, chairman of the committee, gave the following report:

The past two annual reports of this committee have been chiefly concerned with the Social Security program. In 1936 we discussed "What can be expected from the Social Security Act in Improving Public Health activities throughout the state?"; in 1937, "What have we begun under Social Security?"; and this year, time enough has elapsed to expect an answer to the question, "What has been done to improve the public health since Social Security funds have been available?" A brief report of the public health activities of the year will be presented along with the recommendation of the committee.

Local Health Work: The Public Health program is discussed in reference to state department of health activities and to local health department activities. It will be remembered that in order to qualify for an allocation of funds under Title V and VI of the Social Security Act, it was necessary for the state department of health to provide, as a minimum on a full-time basis, adequate provision for the administrative guidance of local health service, which implied that there was full-time local health service to supervise and if not, that full-time

local health service should be developed in North Dakota. Due to the lack of permissive legislation allowing for county health departments, wherein the county health department and the various city health departments may be combined into one department, or to allow contiguous counties to unite to organize a district health department, considerable available funds for full-time local health service could not be used. These funds will have to be returned for use in other states.

In order to qualify for some of these funds, one district health unit was organized during the year. This district comprises six counties: Stutsman, Barnes, LaMoure, Ransom, Dickey and Sargent. The district office is located in Valley City and the personnel includes one district health officer, Dr. Robert G. White, one sanitary engineer, one supervisor of public health nurses, and a clerk. The organization in no way disrupts the present system of part-time county and city health officers. This district office is simply a branch office of the state department of health and is responsible for all public health activities, which would be expected of the state department of health in those six counties. Since no very satisfactory public health organization has so far been devised to fit states like North Dakota, any program instituted at this time in local health organization is more or less experimental.

Control of Preventable Diseases: In the control of preventable diseases, the appointment and meeting of the committee on venereal diseases of the North Dakota Medical Association has been one of the worthwhile activities of the year. While the recent renewed attack against syphilis in the field of public health has been important, a factor of more importance during the past year has been the request to the present Congress for financial assistance for the treatment of syphilis. This is of interest to all physicians and has shown the necessity for a strong committee on venereal diseases in the state medical association as an advisory committee to the state department of health on syphilis control in North Dakota.

Other important activities have been a revision of the regulations related to the control of communicable diseases, the location of three hitherto unreported typhoid carriers, the free distribution of smallpox vaccine, typhoid vaccine, diphtheria toxoid, Schick test material, Dick test material, Mantoux test material, as well as free arsenics and bismuth for the treatment of syphilis. Numerous talks have been given and several newspaper articles prepared as well as the distribution of pamphlets on preventable disease.

Maternal and Child Hygiene and Public Health Nursing: The Maternal and Child Hygiene Committee of the state medical association met in January and should be commended on the earnestness with which they attacked the problems presented. Every member showed a willingness to put time and effort on studying the problems which are met in this field. The report of the activities of this committee will be presented by the chairman. Itinerant pre-school conference work in counties where public health nursing service is available for organization and follow-up work was continued. While funds for Refresher Courses for physicians have been available, no courses have been arranged, except the provision of the lecturers in pediatrics and obstetrics for the state medical association's annual meeting in Bismarck. Twenty-five counties have generalized nursing service and two counties have specialized maternity service. Two additions to the staff have been made—Dr. Elizabeth Smith as Dr. Orr's assistant and Alice Kraft, R.N., as assistant to Margrete Skaarup, R.N. Several public health nurses have been given short courses in training at the University of Minnesota.

Division of Laboratories: Due to the publicity campaign on syphilis, the number of tests have been more than doubled and the Wassermann test is run twice a week or more frequently depending upon the demand. During the year the Bismarck laboratory was moved to new quarters which allows for better development of the work. Complete new furniture and equipment has been installed and an animal house provided at the Bismarck laboratory, while considerable new equipment has been added at the Grand Forks laboratory. Melvin Koons, director of laboratories, has been given a year's leave of absence to do advanced work in bacteriology at Johns Hopkins and returns to North Dakota July 1st. Dr. Harriet Bixby of the

Bismarck laboratory resigned to join the Quain and Ramstad Clinic and was succeeded by Theodore F. Dozois, M.S.

The Bismarck laboratory has been equipped to do the chemical laboratory work necessary in water and sewage supervision activities of the Division of Sanitation during the year with Harry G. Hanson as chemist.

Division of Sanitary Engineering: Milk sanitation has been stressed during the year, but the bulk of the time of the staff members is still occupied with the inspection and approval of the numerous municipal installations where sanitation is an important factor, being made possible through federal projects. No additions have been made to the staff and one engineer has spent the year at Ann Arbor doing advanced work in public health engineering.

Division of Vital Statistics: The demands upon the Division of Vital Statistics have continued to increase throughout the year due to the many federal programs where birth certificates and vital statistics information are required. Revision of our North Dakota Vital Statistics laws would improve the cumbersome methods now used for collecting vital statistics.

Conclusion: After reviewing the activities of the year and the problems which have been presented for consideration, your committee recommends the following:

(a) A careful consideration by the state medical association of permissive legislation to improve local health service, legislation to revise our vital statistics laws, to make more practical provision for the registration of illegitimate births and to improve the present marriage law.

(b) Renewed effort in health education by the physicians of the state, by assuming leadership and supervision over all phases of education related to the practice of medicine, by guiding the activities of the Advisory Health Committees in your county, and by keeping abreast of the developments in modern public health trends.

(c) Since it is stated in the objectives of the American Medical Association and in the principles of Medical Ethics that "the objective of the association is to promote the science and art of medicine, and the betterment of public health," that you urge the physicians of the state to cooperate with their local city and county health officers in the reporting of communicable disease, in the promotion of health education and other activities for the betterment of the public health.

President Goss: Are there any questions you wish to ask Dr. Williams.

Dr. MACGREGOR: I never could understand why they put the responsibility of reporting births up to the physicians. I think it should be left to the people where the babies are born. If they were given to understand they are to make reports, they would do so. It is not always easy when practicing in the country or in the city to get reports out without making a lot of work. I think you would get better results by putting it up to the people themselves. I know where I was born in Canada, people went to the postoffice and filled out a card, and I know records were kept way back for fifty or sixty years, and you can get the records. I think they are putting too much responsibility on the doctors. Make the parents responsible and they will report it.

Dr. LIEBELER: I move that the report be accepted.

Dr. MOORE: Second the motion. (Motion duly put and unanimously carried.)

Dr. LIEBELER: I have the report of the Committee on Maternal and Child Welfare now, if you wish it. This report is given to me to be submitted for the chairman of the committee, Dr. Moore:

Committee on Maternal and Child Welfare

The North Dakota committee on Maternal Welfare and Child Health in submitting this annual report would emphasize that the work entailed by the enlarged function of the committee has necessitated some re-arrangement of its plans and activities. The problem of child welfare alone is so extensive and has so many features to be considered that it did not seem possible for your committee to embrace all aspects of such a program. Accordingly, and because its problems were more immediately concerned with the original plan of the committee, our discussions relative to child health have been largely concerned with neonatal and early infancy problems.

A meeting of our committee was held in the office of the state health department on January 29, 1938, and in an all-day conference certain plans were formulated.

We were fortunate in having not only the state health officer, Dr. Williams, in attendance, but also several other members of her staff, Dr. August Orr, Dr. Cowan, and Miss Margaret Skaarup, R.N., of the public health nursing service. All of these public health officials cooperated splendidly in the work of the committee and furnished valuable information regarding many of the problems which we considered. We were also fortunate in having Dr. L. W. Larson, chairman of the scientific program of the state association, for the Bismarck meeting, at one of our sessions and through him aided in the arrangement for the presentation of obstetric and pediatric subjects on the state program.

More specifically, the following subjects were covered in detail:

(1) We recommend to the state medical association and to the North Dakota Department of Health that maternal deaths occurring in North Dakota must be studied individually. It is felt by your committee that only by an individual analysis of the death of each mother from causes relating to pregnancy and labor can a critical analysis of the causes of maternal deaths as they affect our state be obtained. Such an investigation will require the cooperation of the health department and particularly the cooperation of each individual physician in the state. It is hoped by your committee that the individual physicians will cooperate fully in this undertaking.

(2) While the midwife situation is not a particularly important one in North Dakota, there is nevertheless a certain, definite proportion of labors conducted by midwives, chiefly in the sparsely settled areas of the state. There is no control over such practice. Your committee feels that the practice of these women should be investigated by the state department of health and so recommends.

(3) The subject of public health nursing in maternal welfare and child health was carefully discussed. It was felt by your committee that public health nurses were important educational factors among the laity, especially in the field of pre-partum care and that their chief function in this state was to get the pregnant patient in contact with her physician as soon as possible and under his direction give her such instructions as he wished her to have. To furnish nursing care at the time of delivery and in the post-partum period would more than tax the facilities of the public health nursing service as it is presently constituted, but the committee was assured that the public health nursing service would gladly cooperate with individual physicians by supplying nurses for individual cases upon request of the physicians and when the nurses were available.

(4) The minimum standards of the Farm Security Administration as regards pre-partum care were discussed and a sub-committee consisting of Dr. Paul W. Freise of Bismarck, as chairman, was appointed to interview the proper authorities and offer the services of your committee in working out an adequate program of pre-natal care for its clients.

(5) It was the feeling of your committee that the training in obstetrics and pediatrics offered to nurses in the training schools of North Dakota is, for the most part, inadequate and we recommended that more time be allowed in the nursing curricula for the teaching of obstetrics and pediatrics to undergraduate nurses.

(6) The subject of supplies for the conduct of labor in indigent or border-line cases was considered and a demonstration of the so-called "labor bundle" was given by Miss Skaarup. Your committee feels that many of the lay organizations throughout the state, particularly women's clubs and home-makers' clubs who are especially interested in the subject of maternal welfare, could render a real service to this class of patients by preparing such bundles under competent supervision.

(7) So many different views were expressed regarding the form that refresher courses in obstetrics and pediatrics for physicians should take, that a sub-committee consisting of Dr. Conrad and Dr. Pray was appointed to go into this subject and to arrange such refresher courses as they saw fit. This committee will have a definite plan of action to announce at a later date.

(8) A study of infant deaths in North Dakota shows a considerable number where the cause of death is listed as "prematurity". Your committee feels that such diagnosis is of little or no scientific value and that it would be helpful if further information could be given on death certificates covering the death of premature infants as to the more specific causes, both immediate and remote, which contributed to the death. We recommend that this be done in order that the deaths of premature infants can be studied particularly from the standpoint of prevention.

(9) It is the feeling of your committee that adequate facilities for the care of premature infants is lacking in many of the hospitals of the state and certainly that it is inadequate in the case of most of the deliveries occurring at home. The period immediately following birth is vital to these premature infants, and if they are to be saved, facilities for their care must be available at the time of birth. The financial outlay for such equipment is not great and your committee felt so strongly on the subject that a sub-committee on standards for premature care, consisting of Dr. Ruth Mahon as chairman, was appointed to investigate this problem and make recommendations covering it.

(10) We urge that the state medical association continue its immunization program among children especially in the prevention of smallpox and diphtheria.

(11) The motion picture film "The Birth of a Baby" endorsed by the American Committee on Maternal Welfare, Inc., has aroused much discussion wherever it has been shown. This discussion has been overwhelmingly favorable. The ethical standards set up by the producers of this film and their refusal to allow it to be shown in any state where it has not received the endorsement of the medical profession of that state is highly commendable. Several members of your committee have seen the film. Your committee through the cooperation of Dr. Larson of the Scientific Program has arranged for a private showing of this film to the physicians in attendance at this meeting. We recommend that a vote be taken after the film has been seen as to what method you wish followed in exhibiting the film in North Dakota.

As was pointed out in our report to you at the Grand Forks meeting a year ago, no funds were available for the work of this committee and its individual members had to carry on what work was done at their personal expense. We requested, in that report, that funds be allocated from the state association for at least a minimum amount of secretarial help, but since it was deemed impossible by the state association to supply such funds your committee has, naturally, had to turn to other sources for financial help. We were most fortunate in prevailing upon our state health officer, Dr. Maysil M. Williams, to act as secretary of our committee, and I want at this time to express my personal appreciation and the appreciation of all the members of our committee to Dr. Williams for her invaluable help.

Dr. SPEAR: I move the adoption of this report.

Dr. BENSON: Second the motion. (Motion duly put and unanimously carried.)

Dr. LIEBELER: I would especially call your attention to the paragraph dealing with the film; it is quite a vital question. Many of the physicians of the state have been demanding a showing of this film. Some things are to be said for it, and some not, so please don't overlook the recommendation made by the committee.

President Goss: The report of the Committee on Radio.

Committee on Radio

The following report was given orally by Dr. A. R. Sorenson, chairman of the committee:

Dr. SORENSON: As some of you know who were at the meeting of the House of Delegates last year, the subject of radio broadcasts was brought up. It was decided to appoint a committee who might look up something and report to this meeting.

As you know, the A. M. A. carries on broadcasts as does also the Minnesota Medical Association. Now these are under the supervision directly of the American Medical Association and the Minnesota State Medical Association, and I think if such a thing is to be done, it should be controlled very closely by some organization, either the state organization or the dis-

trict societies, because this thing can carry a lot of dynamite. We can get into a lot of trouble, and make trouble for ourselves by radio broadcasts unless they are closely supervised, so the thing to be discussed by this group is to determine whether they want to go on the air, and if they do, under whose supervision, and where they are going to obtain funds to carry on such a thing.

I believe that we can do ourselves an immense amount of good by going on the air and coming in closer contact with the people, because we cannot individually advertise our wares; they are the wares of the medical profession as a group. In that way we can do not only the laity some good, but ourselves, by coming in closer contact with them. I believe this is a thing we should consider doing; I suggest that a permanent committee be appointed to work this thing out, and be given authority to go ahead and go on the radio.

Dr. MACLACHLAN: It would appear to me that it would be wise to follow the course we have been following in the past, that any such program to go before the public, or the state, should be authorized by this association; that it should be supervised by the state board of health and go out under that heading. It seems to me that we have Dr. Williams here and she might be called upon to advise as to how that would appear to be.

Dr. WILLIAMS: In the state health department we had been thinking for some time about radio talks, but we didn't have much money. Then all at once we decided we would try to see what we could get for nothing on the radio. They asked us to submit the type of material we would like to put on the radio and we submitted three talks for them to go over at KFYZ, and they immediately said they would give us fifteen minutes every week. That was about a month ago and one day this week KCGU urged me to put a fifteen minute talk over the KCGU. They also said they would like to have it hooked up with the other radio stations in North Dakota. There was just one thing about it that they asked us. They said we would have to make the talks ourselves, they couldn't let everybody talk—that is, anybody who was running for any political office. That was one of the clauses but we may have these fifteen minutes now.

I have hesitated to go ahead with this until I had taken it up with the state medical association. I think it is nothing we have to agree on, we all talk the same language, but I would be glad to have your suggestions on these programs.

Secretary SKELSEY: I would like Dr. Sorenson's views as to what town these broadcasts should be from, and to what extent radio work should be done outside of the committee. For instance at Fargo we have some very eloquent speakers with persuasive voices who have been doing some of this work. Is there any objection on the part of your committee to a town like Fargo running an independent program?

Dr. SORENSON: This committee did not attempt to formulate any plans. The idea was to bring this up for discussion, and it should be decided, I believe, by the state association as to whether they are going to sponsor it, or whether we allow the individual society to sponsor the programs.

Secretary SKELSEY: Isn't this a good place to thresh it out?

Dr. SORENSON: Yes, I think so.

Dr. LIEBELER: I want you to know that Fargo is not the only city in North Dakota that has sponsored that sort of thing. Grand Forks has been on the air quite repeatedly.

Dr. RAMSTAD: This is probably a small matter to bring up at the present time, but it is something that is going to grow. I hope we will not neglect the opportunity to present medical facts to the public in the proper way. I think the state society should not overlook the opportunity to maintain control and sponsorship of programs put out in North Dakota. Not long ago I talked with Mr. Fitzgerald of KFYZ, a very bright young man, and he said he would be delighted to give opportunity to the medical profession to present their side of the matter to the public. However, I feel that the state society should maintain control of this through either a committee—I suppose likely the thing would rest with the council of the state society—or they could have a committee appointed that would regulate this matter and keep it from getting into wrong hands.

Not very long ago I had a letter from Dr. Drew stating they had a great deal of trouble up there. Some chiropractor, some irregular, was advertising over the radio that he could remove tonsils and other troubles by chiropractic methods, and wanted to know what to do about it. I told him I didn't know. I believe it would be a wise plan for the committee appointed last year to formulate some plan and make recommendations so we could take some action at this meeting.

Secretary SKELSEY: I would like Dr. Darrow to tell how satisfactorily the work in Fargo has progressed.

Dr. DARROW: The radio talks are all given under what in Cass County we call the radio committee, which is merely under the direction of Dr. Brown, and he has been very good about it. The way they get the time is simply this: These talks are considered to have a general interest to the public, and all these radio stations are required to have a certain amount of educational programs. That is one of the national requirements to the stations, and that is where we come in on it. So far they have not always given us the most desirable time, but you can't "look a gift horse in the mouth," and we take what they give us. There have been some talks on cancer. There was a symposium of three different talks on syphilis, one giving the prevalence and the other the public health aspect, and the third the treatment of syphilis; the responses to these programs were very satisfactory. I know on the basis of what we have given so far the station is going to give us more time. They have more time in the summer than in the winter, anyway, and it is the plan of the Cass County radio committee to have these talks about once a week, or once in two weeks. The more regular you could have it the better. They begin looking forward to it and I believe these talks are a very good thing. So far as I know there has been no objection to these talks from any source. They are always stated, and it is called in the newspapers where they have the advertisement, the Cass County Medical Association program. It is very satisfactory and I am sure it does some good. As different problems come up it gives us a chance to put them before the public.

Dr. MACLACHLAN: It appears to me that such talks would have greater force with the public if it were known that they were prepared by the state medical association with the co-operation of the state health department rather than having them emanate from different local sources, and the profession generally not knowing what was being prepared, or what was being given out at the local radio station. If these central radio stations or organizations were notified that these talks were being prepared in this way and so sponsored, and the public so advised, they would have very much greater force than if they were coming from some local station and on different topics and different points. It seems to me the association should be behind all this and that the state health officer should be one of the members of the committee, if you appoint such a committee.

Dr. McCANNEL: These programs originating in local societies and other counties, no doubt have been in manuscript form. Why not have a clearing house in our state committee on radio and have these so they will be given simultaneously on the different radio stations, for instance at Devils Lake, Grand Forks, Minot, etc. These good programs then could be put on simultaneously over the state and it would help some of the weaker stations probably to get the program, if it were made uniform over the state.

Dr. SWANSON: You mean all of these manuscripts would have to be submitted to your committee before being given over the air and would have to be okayed by the committee of the state association before they are given over the air?

Dr. McCANNEL: It would be a good plan to have a clearing house and act altogether.

President Goss: Would that be a state committee, this clearing house?

Dr. McCANNEL: Yes.

Dr. FOSTER: I feel that it is well that the control be retained by the state medical association, or its committee; however, from the transactions of the former meetings which I have read, and from some comments I have heard here, I take it that the activities of some of these committees are a wee bit slow. Now if you make the mechanism of carrying on an activity like this so cumbersome, it becomes top-heavy and it dies of its own

inertia. I think the component medical societies are trustworthy enough and carry sufficient authority in their own districts to have the authority delegated to them by the state medical association to proceed with the local program, as they desire. Personally I have quite a strong feeling that if you try too strongly to centralize such a program, it will lose its effect and will be lost in the shuffle of the activity. Trying to get a state hook-up is rather an unwieldy affair. These programs are put on by the individual stations on time such as they have available. That time will not be the same throughout the state at the various stations. Therefore, it will be much more cumbersome to attempt to get the same time on all of the stations. That is what you had in mind in clearing the various manuscripts, or did you have in mind having the manuscripts okayed by the committee of the state association?

Dr. McCANNEL: Yes, the manuscript of the local society.

Dr. FOSTER: You mean to have every manuscript before it can be broadcast, okayed by the state association?

Dr. McCANNEL: By a committee of the state association; then the district can put on the program.

Dr. FOSTER: But you don't mean to regulate the activity of say Cass or Grand Forks or some of the larger associations?

Dr. McCANNEL: I think they would be glad to cooperate.

President Goss: Dr. Sorenson, do you prefer to have this referred to the reference committee?

Dr. SORENSON: Yes, I would recommend that. I move that this report be referred to the reference committee for further action.

Dr. WALDSCHMIDT: Second the motion. (Motion duly put and unanimously carried.)

We will hear the report of the Committee on Venereal Disease, Dr. Darrow.

Committee on Venereal Disease

Dr. Frank I. Darrow, chairman of the committee, gave the following report:

Your committee met with the state department of health during the first part of the year and the attached recommendations were formulated.

As was recommended, all of the district societies held meetings on syphilis, at which the subjects of "Reporting the Disease," "The General Problem of Syphilis," and especially the "Diagnosis and Treatment of Syphilis" were discussed.

The problem has received such national recognition that one branch of the National Legislature has already passed a bill authorizing the expenditure of a large sum of money to be distributed to the various states for the extermination of syphilis. Just what the requirements for participation in these funds are we do not know. It is reasonable to suppose that some estimate of our state problem will be required. This will entail some sort of a survey to determine the number of syphilitics now existing and how many new cases may be expected. They will have to be assured that the cases treated under these funds can and will have proper and adequate treatment. No doubt an estimate of the amount of money we feel will be necessary will have to be given.

As you all know, it has been stated by those in high authority that there is a considerable percentage of doctors not capable of properly treating syphilis. While we do not feel this is a big problem in North Dakota, it is the opinion of your committee that refresher courses in the treatment of syphilis is the best way of showing that our doctors are capable of carrying out the modern treatment of syphilis.

As to the schedule of fees: While in our first recommendations these were mentioned, we feel that any fee schedule made by this or any other committee of our society should be okayed by the committee on medical economics before being publicized in any way.

To assure those in charge of the funds that cases are properly treated and followed up, some standard form of record sheet will have to be adopted and regular reports made to show that the treatment is being carried out.

We feel that our present state law is adequate to handle the venereal disease problem and shall recommend that funds be allocated for the enforcement of this law. We also feel that any administrative set-up should be carefully considered, knowing that these departments tend to grow out of proportion to their usefulness.

We also recommend that the new committee for the ensuing year be appointed as soon as possible as the time for its greatest action will begin as soon as the law passes Congress.

Our recommendations are as follows:

1. Information regarding prevalence and expected prevalence of venereal diseases in each district, applying rate of two per 1,000 population, be furnished each district medical society.

2. The present method of reporting venereal diseases to the state health department be continued.

3. The state department of health act as a clearing house for consultation services requested by physicians in treatment of venereal disease cases.

4. The function of the public health nurse in the venereal disease program be to collaborate with the physician at his request. No investigation should be made by the nurse except on request of the physician.

5. Dr. L. W. Larson and a representative from the state health department attend a meeting of the State Welfare Board for the purpose of acquainting them with the venereal disease problem in North Dakota.

6. A publicity campaign instigated to secure sources of infection to venereal disease cases.

7. That in each district medical society, a meeting should be devoted entirely to the venereal disease program of the state department of health. At this meeting the set-up of venereal disease reporting, control methods, etc., should be discussed.

8. The venereal disease committee recommend to the State Welfare Board that indigents be treated on the family physician-patient basis. Venereal disease clinics such as those in Fargo and Grand Forks should be discouraged.

9. The fee for treating indigent cases of syphilis be \$2.75 for intravenous treatment and \$1.50 for intramuscular treatment when material is furnished by the state. When material is not furnished by the state the fee should be the same as at present—\$3.34 intravenous and \$1.67 intramuscular.

10. Routine Wassermanns be taken on hospital admissions, complete examinations, insurance examinations if possible, first prenatal examination, in all state institutions, possibly including colleges and the University. Repeated treatment should be given during each pregnancy of a syphilitic mother, and treatment should begin before the fifth month of pregnancy. The Wassermann examination should be included in examinations of indigents for the same fee, \$3.34.

11. The venereal disease committee of the state medical society to recommend to the state health department to make available, where practical, the darkfield examination to physicians, using capillary tubes for specimens sent by mail. These examinations should be made on all suspicious syphilitic lesions.

12. The recommendations of the cooperative clinical groups be adopted as the standard treatment for early syphilis.

13. Refresher courses (in venereal diseases) be offered in each district medical society. The state department of health will participate in this financially.

14. Education of the public. Various members of district medical societies to aid in the education of the public by giving talks to lay groups. Speakers' outlines of such talks may be obtained from the state department of health.

Dr. BENSON: I move the adoption of this report.

Dr. SPEAR: Second the motion.

Dr. DARROW: The committee would appreciate a discussion of this report. I might say I consider this a pretty important problem to our medical association and any helpful suggestions or recommendations by this august body will be highly appreciated.

Dr. LIEBELER: Do I understand there are funds available to provide salvarsan treatment for every patient who would require the treatment?

Dr. DARROW: Yes, the state supplies that.

President Goss: Would you care to have this referred to the reference committee?

Dr. DARROW: I would like to know what the men think about this syphilis problem because that is the only way your committee can express the will of the association. This problem is going to come right up to us. There will be a lot of money spent on syphilis and there will be a chance to be paid for taking care of these syphilitics; in talking informally with

the committee, the thought was, that if we let the thing slide by, chances are they will have a model form they will send out and that will be the way the thing will be done in North Dakota. On the other hand, if we formulate a plan beforehand, it will be done the way we want it done. Your committee will pass the word along if you have any suggestions.

Dr. WILLIAMSON: Has the committee any plan in mind now?

Dr. DARROW: Nothing except the general principles I read in this report: that we feel the patient-physician relationship should be maintained; that any social service work should be more or less under the direction of the physician, that he should say when it should be done, and then in order to have some authority, that the teeth in the law should be supported by funds. We have had this law for fifteen years and there were only funds for this law to be enforced for one or two years and there has never been any funds since. In order to get any place with this, we must have the law enforced. The law says the patient must have treatment, but there is nothing to back it up. If this federal money comes in here, there will be plenty of money to handle this. Dr. Fishbein said there was not fifty per cent of the doctors capable of treating syphilis. Some of these things are real problems and they are going to come up, so what I would like to hear is a little discussion as to what you fellows think about that. Personally I think that more than fifty per cent of the doctors are capable of handling syphilis. They might decide to have clinics in the bigger towns and in that case the country fellow wouldn't have a chance. What we want to try to do is to maintain the physician-patient relationship and give everybody a chance to have some of this money; of course, the idea of getting rid of syphilis is of prime importance. The money consideration should be secondary. I think the thing will be handled more efficiently if it is kept on the family-physician basis as we always have felt medicine should be.

Dr. LIEBELER: Right now the doctors for the treatment of syphilis are being furnished medications from our own state for everybody.

A Delegate: Who pays the Doctor for his work?

Dr. DARROW: The patient pays you for his work.

Dr. LIEBELER: I have some of them now but you see they are taken care of by the Welfare Board. The medicine is furnished from the state. This new law, if it goes through—was supposed to be passed in the Senate today, I believe—will take care of lots of funds.

Dr. WILLIAMSON: This has been a very fine report. I think it is one of the best committee reports we have had today. I would suggest that if this is practical, we allow the committee to formulate plans, as Dr. Darrow has suggested. If necessary, they might have a circular letter printed outlining this plan, and send it to the members of the association.

Dr. DARROW: The committee wants that recommendation. I think time will have to elapse until we can see that law.

Dr. WILLIAMSON: I would make a motion that this be left to the committee to handle, and if it be necessary in their judgment, to have a circular letter framed and sent to every member in the association, to every doctor in the state, through either the Public Health Bureau or the association.

Dr. STACKHOUSE: Second the motion.

President Goss: I will substitute Dr. Liebeler in place of Dr. Woutat on the reference committee.

We will have a report of the temporary committee on the Constitution. Dr. Fawcett is the chairman.

Committee on Constitution

We, the committee consisting of Drs. Williamson, Woutat and myself, have had several sessions. We have no written report to make and what I have to say today represents the thoughts of the three men. We have nothing concrete to recommend, only suggestions. We come before you today asking that we either be discharged because we did not get it through in one day, and a new committee appointed, or else that we be allowed to go on until the next meeting of the Councillors.

Here are a few suggestions that we want to make. I wish you all had this little pamphlet, which was put out in 1919. There are very few on hand.

Now under "House of Delegates," we would like to add to that to have as the membership in this House of Delegates, the treasurer. The treasurer has had no vote in the House of Delegates. Then it was suggested to us that all past presidents, although they are members of the executive committee, are not legally entitled to vote. We recommend they be entitled to vote. Dr. MacLachlan brought that out in the meeting at Grand Forks last year.

We also recommend under the heading of "Council" that the Board of Trustees, or, as in this constitution and by-laws designated, the Council, shall consist of ten councillors, elected by the House of Delegates and the president and secretary, ex-officio. Besides its duties mentioned in the by-laws, "it shall have charge and control of all the property of this association of whatsoever nature and of all funds from whatsoever source." And then add to that, "and that at their last meeting, that they vote a certain sum of money to be set aside for expenses during the year." That is for the president going from place to place. The executive committee last year made two trips here to Bismarck, and I think all the members of the executive committee paid for that. I don't think there was any authorization of that and there should be some arrangement made for that in the constitution.

"The officers of the association shall be a president, a first vice-president, a second vice-president, a president-elect, a secretary, a treasurer, and ten councillors." Add to that the delegate to the American Medical Association. He should be elected as we have been doing but it is not in the constitution. An alternate should be elected and that should be in the constitution.

I don't suppose we can put this in the constitution, but we recommend that the delegate to the American Medical Association (and it is generally understood among us, that he serve from year to year) have an unlimited term. Maybe some attorney could figure out a way of putting this in the constitution so that it would be legal. As you know, I was a special delegate in the interest of the medical school last year to Atlantic City, and through the good graces of Dr. Nachtwey I sat in at the House of Delegates meeting. It seemed to me that every member in that House was a man who had been a delegate for twenty years, twenty-five years, and all down the line; men who had been coming there for years, and they were the men who had the chairmanship of the different committees. In discussing the matter with some of the men, we found that very often the delegate was sent just because he was a good fellow, or perhaps he was the retiring president. We believe, as a committee, that is wrong; that we should send the same man year after year. We should agree on somebody and he should be the delegate over a period of years. I am not talking for Dr. Nachtwey, or any particular delegate, but I think we should have one man, and keep sending him. I know for many years, Dr. Pigot of Montana, a classmate of mine, was the representative from Montana and he got to be the head of several committees. He was a power in the House of Delegates because he knew the ropes. Just take that for what it is worth.

Another question has come up about the fiscal year of this association. We thought the fiscal year of the association should be from the first of April, and the district societies should be from the first of the year.

Regarding the executive committee, we feel it would be better that the executive committee be appointed by the council, with the president sitting in with them, rather than be appointed by the president. The council is really the governing body of our association and it should pick out the executives. The president and president-elect are ex-officio members anyway, together with three other men. I think the council, with the other men, should be worked out that way.

In the different societies, it says here, they should elect a delegate but makes no provision for electing an alternate. However, I think most of you do approve of it, and it should be in the constitution. An alternate should be elected instead of appointed by the president.

We have left out all that part as regards legal protection in malpractice cases. That is about all I have to say on that.

The question of committees is the biggest proposition we have. How many committees shall we have? Last year the

committee on committees was appointed, but that didn't seem to meet with the agreement of our committee; we would like to have you take for consideration today the question of committees. As it stands now we have the executive committee, committee on public policy and legislation, medical education, necrology, medical history, permanent history, public health, THE JOURNAL-LANCET, cancer survey, tuberculosis, fractures, medical economics, maternal and child welfare, a separate committee on crippled children and venereal disease and a committee on radio. This committee on the constitution is only a temporary committee and that can be left out.

I have talked this over with Dr. Williamson since I came here, and there has been a lot brought out in discussion today. As a number of these committees are working hand in hand with the Federal government, we can't cut them out. They are a part of our state organization as well as of the Federal government.

We had hoped to have all this printed in a form that could be passed around. However, changing this around is a big task, and we would like to have some discussion. Either discharge us and get some new committee, or let us go on a little while and see if we can finish it up.

Dr. MACLACHLAN: I move the present committee be continued for another year.

Dr. LIMBURG: Second the motion.

Dr. WILLIAMSON: This has been before the House for a year, so if the committee is continued, would it not be possible to submit the report to the council sometime after the first of the year? I would suggest that we have the council meet and pass on it and okay it, and then have it printed so we can have it distributed next year. I don't know if we will get any further by leaving it until the next meeting, than we will if we have the council pass on it the first of the year, after the committee has completed its work.

Dr. NACHTWEY: Dr. Fawcett asked me to comment a little on this constitution in regard to changing one phase of it, the idea being that we would increase the official body by electing a speaker of the house and alternate speaker. The purpose of the speaker of the house would be to conduct the meetings each year of the House of Delegates. The president would continue, as he does now, conducting the scientific assembly and all other business. This is a business organization, and it would be taken care of each year by the same man. It would be the duty of the speaker of the house to contact the various committees who are going to bring in resolutions for adoption so they can be brought up in a business-like manner and referred to the reference committee.

I believe this is my first experience in this association in having a reference committee. The purpose of that reference committee, I presume, is the same as exists in the A. M. A. meeting; for instance, some of these reports are referred to the reference committee. Now Dr. Sorenson will come before this reference committee, as I understand it, and there we will thresh it out; that is, the difficulties we have not been able to decide here. Then tomorrow at our meeting the reference committee will bring in a report, and that can be discussed further. So my suggestion would be to increase the officers by a speaker of the house, and he would come up for election each year. If he proved satisfactory, he would continue on from year to year.

Dr. FAWCETT: I intended to mention that a bit in my report. I knew Dr. Nachtwey was a little more familiar with it than I. We thought it was more an idea of relieving the president at the regular sessions of the meeting, so we as a committee turned it down. Since coming here and getting an explanation more thoroughly worked out by Dr. Nachtwey, we find that the idea is more to relieve the president at these business meetings. I am more thoroughly sold on the proposition that he would be the presiding officer at the business meeting just the same as is done in the A. M. A. The president of the A. M. A. does not preside at any of these business meetings at all. Dr. Nachtwey's idea is that the man who would be the speaker of the house would preside here. Dr. Nachtwey says he would be elected each year. It looks to me as though it requires an experienced man; we need a man to be trained from year to year. We don't change our secretary each year; we

don't change our treasurer. If we do put that in our constitution, we should not change the speaker every year. It takes quite a while for a man to become familiar with the procedure. Have you attended one of these tri-state meetings? The speaker there has been there for years. He is one hundred per cent chairman, and this man who presided at the American Medical Society was also, but he has been there for years, and he is trained in it. He is a proficient chairman—not throwing any reflections on our chairman today. You will notice in the program this year, different men are presiding at different times—the vice-president, president-elect and the second vice-president—in order to break them in as presiding officers.

Dr. NACHTWEY: The only reason I said this speaker must be elected each year, is that this is a democratic organization, and if we attempt, for instance, to elect a speaker for five or ten years, there would be a little bit of log-rolling. If the speaker proves satisfactory, he can be reelected, just as the other officers are reelected. They are all reelected and there is nothing to prohibit one from being elected each year. He must be elected by the House of Delegates because after all he is their speaker and they are the ones to say whether he should continue in office.

President Goss: You have all heard the motion which has been seconded, that we continue the same committee on constitution for another year. *Carried.*

Secretary SKELSEY: So far as I can tell, there are only two committees lacking reports, the one on Fractures and the one on Tuberculosis. Outside of those two committees, I think we have finished practically everything.

Dr. MACGREGOR: We are to have a meeting of the council after this meeting, so I think we should adjourn now.

Secretary SKELSEY: The Resolutions passed by the Illinois State Medical Society and the Missouri State Medical Society are here. Is it the desire of the House to take any action on this? (Subjects: Opposition of those two state organizations to Federal recognition of osteopaths being employed on Federal employees' compensation practice.)

Dr. NACHTWEY: Refer that to the reference committee.

Secretary SKELSEY: We also have a communication from the president of the American Pharmaceutical Association. What shall we do with that? (Subject: Publicity pamphlet *re* Governmental Control of Medical Practice.)

A Delegate: Give it to the reference committee.

Dr. WILLIAMSON: If the members would care to be present, there is going to be a meeting of the Board of Examiners tomorrow; that is a special meeting, and I have drawn up a new set of rules and regulations governing the admission of candidates at this time. If you would care to remain and listen to it, I will read it now. We might get some important information, which we would change.

(Dr. Williamson read the set of proposed rules.)

A motion was duly made, seconded and carried, to adjourn until 5:00 P. M., May 17, 1938.

THIRD MEETING HOUSE OF DELEGATES

The adjourned meeting of the House of Delegates was called to order at 5:00 P. M., on May 17, 1938, by President Goss.

Secretary Skelsey called the roll, the following members being present:

Doctors:

M. MacGregor, Fargo
G. M. Williamson, Grand Forks
A. R. Sorenson, Minot
N. O. Ramstad, Bismarck
P. G. Arzt, Jamestown
A. E. Spear, Dickinson
J. C. Swanson, Fargo
A. M. Call, Rugby
F. E. Wheelon, Minot
Will H. Moore, Valley City
R. H. Waldschmidt, Bismarck
C. H. Sherman, Oakes
A. P. Nachtwey, Dickinson
Syver Vinje, Hillsboro
D. W. Matthaei, Fessenden

A quorum was declared present and the following proceedings had:

President Goss: Dr. Sorenson, you have a report which you would like to present right away. Will you do so now?

Committee on Crippled Children

Dr. A. R. Sorenson, chairman, presented the following report:

This committee wishes to report that upon investigation, there has been found to be considerable dissatisfaction among the surgeons of the state on the administration of the program for the care of crippled children.

This program comes under the supervision of the Division of Child Welfare, a strictly Federal set-up.

The difficulties which have arisen have come mainly from a misunderstanding by the case workers who contact the cases. It would seem that it is their belief that these cases must be sent to certain designated men specializing in orthopedic surgery. This apparently is not the correct interpretation of the program, and from whom they have received their instructions this committee does not know.

The program as drawn up by the board would allow for orthopedic cases being cared for by any surgeon capable of doing the required work, and these cases referred to such a man living in the immediate vicinity where the cases arise. It is, of course, obvious that the board which administers this program should have some assurance that the men chosen for the work are capable of carrying it out satisfactorily, and that there will be value received for the money expended. It could not be left up to the discretion of any practitioner whether he would elect to treat the case or not.

It is therefore felt by the committee that this association should set a standard of qualifications for practitioners to which they must comply before being allowed to participate in the program, which standard would be acceptable to the Division of Child Welfare.

It is accordingly suggested that the House of Delegates accept the following resolution, and that a copy be sent to the Division of Child Welfare:

"Be it resolved, that the North Dakota State Medical Association recommend to the Division of Child Welfare that the care of crippled children be allocated to doctors holding membership in the American Board of Orthopedics, the American Board of Surgery, the American College of Surgeons.

"That investigators of such cases be instructed to refer them to qualified surgeons in the immediate vicinity who may then elect to treat them or refer them to orthopedic specialists."

Dr. WALDSCHMIDT: I move the adoption of the report.

Dr. NACHTWEY: Second the motion. (Motion duly put and unanimously carried.)

Dr. WOOD: A suggestion has been made to me which I think is a very good one: that this Committee on Crippled Children while here meet with the main committee at the Capitol, and take the matter up with them in person.

Dr. McCANNEL: I think that is advisable right away because Miss Allen was to have her report in by the 15th, but we prevailed upon her to hold it up until after the state meeting. She wants to incorporate this.

Dr. SORENSON: I think the committee can accept that suggestion.

President Goss: Dr. MacLachlan, are you ready to report for the Committee on Tuberculosis?

Dr. MACLACHLAN: I have a copy of the report here. Dr. Glaspel said he was going to present it, but he is not here. It isn't very long, if you care to have me read it.

Dr. WILLIAMSON: I move that we dispense with reading of same, and file the report with the secretary to be included in the proceedings of this meeting.

(Several seconds were heard; the motion was duly put and unanimously carried.)

Committee on Tuberculosis

Dr. Charles MacLachlan, chairman, filed the following report:

To your committee, after a careful analysis of the tuberculosis records in our state, it is evident there are certain fairly well defined areas where the disease is endemic.

It would appear that in any general plan to eradicate the disease, these centres should first be subjected to attack following the course that is today in vogue in controlling and overcoming local epidemics of the acutely contagious diseases, viz., first, establishing the fact of its presence, then caring for the individual attacked, determining whether contacts also have become a menace to society and, lastly, subjecting the contacts already infected to recognized examination and restriction.

In successfully planning to promote any such campaign of eradication, coöperation of state and local health organizations is the first requirement. Leadership should be assumed by the local board of health, with the local doctors and nurses vitally interested in its success, enlisting the support of the press to arouse and maintain community sympathy and coöperation.

The initiatory activities should be directed within the grade schools, including teachers as well as pupils; then to the students of high schools and those of any other still higher institutions of learning that there may be in the infected community, skin-testing, chest X-raying and keeping permanent record of findings.

Where positive findings are evident, the homes and intimate contacts of the infected should be similarly examined and results recorded. Eventually, the parents, the children under school age, the male and female help and every resident of the community should be included in the campaign of extermination.

In this survey it may be ascertained that the teachers are not infrequently found to be conveyors of the disease. Within the past five years the State Sanatorium records show that there were being treated there, at one time, twenty-three teachers who had recently been teaching in North Dakota schools. Of these, fifteen were "far-advanced" cases, and nineteen of the group were sputum positive. Considering the number of children thus daily exposed to possible infection throughout the state, should we not insist that all teachers serving in schools of training be called upon to successfully pass a chest X-ray examination and to present a certificate of same when making application for employment. This certificate should issue from the state health department or from a group of capable technicians equipped to give the service. The expense should be born by that department or by the office of the department of public instruction, and such examinations should be conducted once a year, or in suspected or exposed cases, on the order of the county superintendent of schools, ex-officio president of the local board of health. It would appear to be unfair to the teaching profession to impose upon them personally the cost of this requirement in the interest of public health.

Within the past two years, progress has been made in the application of moneys, varying as the Christmas seal sales vary in the respective counties, toward chest X-raying suspects and skin testing the children in grade schools. This is especially practical in the children in the upper grades and in high schools, as from the San Haven records it will be found that a considerable number of these have acquired the infective type, and in the adolescent, the disease is most difficult to arrest.

Your committee is further of the opinion that abandonment of regulations that call for provisional quarantine of residents acutely infected with contagious disease, or under suspicion of same, is to be condemned. The people of North Dakota are not all sufficiently informed, public spiritedly minded to otherwise intelligently cope with contagion, and, further, that until the state health department and state health association have fully assured themselves that contagion can be otherwise held in control, existing quarantine regulations should obtain and that these should also be made to apply to sputum positive potential spreaders of tuberculosis.

The Departments of Public Health and of Education should coöperate in a well-planned campaign of contagion education, using the press locally and state-wide, together with the radio that we may have a well informed and actively coöperative public, health-minded, to carry out their plan of contagion control, employing liberal use of our laws to interpret the significance of the fact that every contact of contagion is a suspect.

Freedom of contagion of whatever character, tuberculosis included, of teachers and of pupils of grade and high schools should be the first objective.

Summing up the trend of effort being made, real progress in control can thus be safely assured, but we are still a long way from the goal of state eradication of tuberculosis. Yet activities in the past few years have been encouraging. Real progress has been made.

Those of the general public and of our profession who visited the state sanatorium ten to twenty years ago, and who have made a return visit within the past year, were very favorably impressed with the increased accommodation afforded in the meantime for the care of the tuberculous; with its up-to-date equipment for chest surgery; its improved sanitation; the enhancement of its natural landscape beauties; and the remarkable increase in its patronage. Its patient population has nearly trebled in the past ten years, and with this increase, necessary physical feature additions have been provided.

Instance the construction of the children's building, nurses' home, Degree of Honor cottage, laundry, slaughter house, and last but not most important, the construction undertaken over two years ago of a \$300,000 infirmary unit capable of accommodating 125 bed patients, thus caring for a long list of patients who in their homes were being denied institutional treatment and were obliged to seek care in sanatoria outside of North Dakota.

These improvements did not materialize without effort. The fruits evident in the past two years are the result of determined planning for and diligent effort toward bringing about their accomplishment, and in this federal and state legislative agencies were successfully enlisted to forward the projects. Quoting a national tuberculosis official in regretting the retirement last year of the superintendent:

"I have always felt that your viewpoint on tuberculosis was most modern and that you took an institution in a poor state and developed it into one of the best in the country."

This is surely sufficient evidence to establish the state sanatorium's reputation for service.

A consulting staff of reputable state specialists was added without cost. Grounds for a fine golf course were provided and developed; a tennis court and skating rink likewise, for the recreational benefit of nurses and other employees. The entrance to the institution was changed to become an off-chute of the highway and turnpiked into the grounds from Dunseith, greatly overcoming the menace of traffic dust. However, the financial depression has lessened the percentage of pay patients, which ten years ago was around fifty, to a minimal of five per cent.

All of which is respectfully offered.

President Goss: Dr. Campbell is here now. Will you give the report of the Committee on Fractures.

Committee on Fractures

Dr. R. D. Campbell, chairman of the committee, presented the following report:

With the cheerful reception you gave Dr. MacLachlan's report, I take it you do not require a very lengthy report about fractures.

There is one thing about the committee on fractures I wish to mention: It isn't feasible to have a committee meeting at the sessions here, just for a few minutes, or at a luncheon. It does not seem very satisfactory, and I wonder if there is some plan by which there could be something constructive gotten out of a committee report of that kind. You wouldn't expect a report covering all the history of fractures, because there are a great many that aren't very much different from year to year; and the committee is quite large. However, if you will let me tell you what we have done in Grand Forks, I will not keep you long.

There have been so many road accidents that the care of the injured person at the time of the accident has become quite a serious problem. We in Grand Forks have a city ordinance that every one having an ambulance or conducting business along that line must be provided with splints, particularly the Thomas splints. We get from Dr. Webb, chief surgeon of the Great Northern Railway, a moving picture which we show all the undertakers in Grand Forks, together with their assistants. We also invite various foremen and officers of the Great Northern and show them that moving picture, which I pre-

sume a great many of you have seen. It is a picture taken by the Chicago policemen in which they demonstrate the use of the splints and the conveyance of the injured person from the point of injury to the hospital. We showed the picture and also demonstrated the use of the splint on the young man who was there, and I am quite sure each of the undertakers has a set of splints. They can have them made at the Great Northern shops; they are not expensive, costing \$1.50 a set. They are not silver-plated, but answer the purpose very well.

I feel with the speed on the road that it is very essential that every one attempt to handle an injury of that kind with efficiency, and be familiar with the first-aid treatment. I think the more it is agitated, the better. If the medical men take an interest in it, I think the majority of the cities will pass an ordinance such as the one we have copied from the one made in Chicago. It is not exactly the same, but it is copied from it. The health officer was very helpful in getting the commission to adopt the ordinance as it is now before us. I don't know of any other city that has that in force. I know there are several who have been thinking of it, but I believe we have the only one in force.

I regret very much I haven't a better report, but I really think it is not advisable to give a very lengthy report, if you are going to do it after you have been at the annual meeting. It is not feasible that we can get the distinguished men on that committee to meet at some point. I think that is one subject that you gentlemen should consider.

Dr. McCANNEL: I think Dr. Campbell is familiar with the fact that the American Red Cross has been putting on a very intensive program on first-aid road stations. They demand that there be at least two attendants trained in the first-aid course. We have been fortunate in our section in complying with that in all small communities. We have a wealth of material in first-aid works, and those fellows get wonderful training in first-aid fractures. In its book that we use—the outline—a chapter is written by Scudder for the American Red Cross. If your Red Cross Chapters in your counties are putting on the first-aid courses, it is a mighty good course to urge. We have graduated something like 300 in Ward County.

Dr. CAMPBELL: Is there any town that has an ordinance where it is compulsory to have these ambulances so equipped?

Dr. McCANNEL: Minot has, doesn't it, Dr. Sorenson?

Dr. SORENSON: I don't believe there is an ordinance but they are all equipped.

I move the report be adopted.

(Several seconds were heard; the motion was duly put and unanimously carried.)

President Goss: Dr. Nachtwey will make the report of the Reference Committee.

Report of Reference Committee

Dr. A. P. Nachtwey, chairman of the reference committee, presented the following report:

In regard to the report of the committee on legislation, the reference committee agrees with the report in its entirety, but believes that the report should not be made public, and should not become a part of the public record.

Your reference committee submits this section of its report and moves its adoption.

Dr. SORENSON: Second the motion. (Motion duly put and unanimously carried.)

Dr. NACHTWEY: I shall read the report of the Committee on Radio as presented to us by Dr. Sorenson:

"It is recommended that the North Dakota State Medical Association sponsor radio broadcasts on health subjects;

"That a committee of three be appointed by the president whose duty it shall be to censor all programs going out over the air;

"That there shall be one member of the committee responsible for obtaining suitable programs such as those given out by the A. M. A., New York Medical Association and University of Minnesota; that this person be paid the actual expense of obtaining this material, plus a remuneration of \$100 per year;

"That if local societies wish to broadcast a special program, that it be first approved by the committee;

"That programs be announced as sponsored by the North Dakota State Medical Association, and local societies, and that no doctor's name be mentioned in conjunction therewith."

Your reference committee concurs in the report of the committee on radio and moves its adoption.

(Several seconds were heard; the motion was duly put and unanimously adopted.)

Dr. NACHTWEY: (Reads letter from the American Pharmaceutical Manufacturers' Association.) In regard to the letter from the Pharmaceutical Association, which I have just read, relative to the displaying of pamphlets issued by them, in physicians' reception rooms, it is recommended by this committee, that while we are in accord with the recommendations of the Pharmaceutical Association, we do not think it is to the best interests of the profession that they be displayed as they suggest.

Your reference committee submits this section of its report and moves its adoption.

Dr. FAWCETT: Second the motion. (Motion duly put and unanimously carried.)

Dr. NACHTWEY: I shall read a resolution adopted by the Illinois State Medical Society:

"Whereas, H. R. 4650, introduced in Congress by Representative Drew of Pennsylvania and recommended favorably to the House by its committee on the judiciary, proposes to qualify osteopaths specifically by federal law to treat patients who are eligible for medical care under the provisions of the United States Employees' Compensation Act; and

"Whereas, this proposal, being in direct conflict with the legislative rights of the several states to prescribe the standards of medical practice, is contrary to the principles of constitutional government in America; and

"Whereas, the granting of special privileges as proposed in this measure to a specific and limited group of practitioners who do not meet the broad requirements of practically all states for the practice of medicine in all its branches is clearly a matter of class legislation; and

"Whereas, the granting of special privileges to one group of limited practitioners would justify and warrant demands on the part of any and all other classes of practitioners in the whole field of the healing art for similar consideration; and

"Whereas, the cost of providing medical care to eligible patients would be greatly increased if administration officers were compelled to recognize the services of limited practitioners who are not qualified to practice medicine in all its branches; and

"Whereas, there is no demand on the part of either the public or the persons eligible for medical care under the provisions of the United States Employees' Compensation Act for the services of practitioners who are not qualified to practice medicine in all its branches; and

"Whereas, the extension of privileges by the Federal Government to limited practitioners would and could have no other effect than to lower the standards of medical practice; and

"Whereas, the best that medical science and skill are able to provide is now available to the eligible patients so that neither necessity nor expediency demands a change as proposed in H. R. 4650; therefore, be it

"Resolved, by the council of the Illinois State Medical Society in special session assembled, that H. R. 4650 is contrary to the best public interests, that its enactment would tend to lower the standards of medical practice, would result in no benefits to the public or to the government or its employees, would increase the cost of medical care without yielding compensating benefits and ought therefore to be defeated; and

"Be it Further Resolved, that copies of this resolution be forwarded to each senator and representative in Congress from Illinois and to the secretary of each state medical association in the United States."

It is the opinion of this committee that the resolution as read be adopted by the North Dakota State Medical Association, in toto; and your committee moves the adoption of this section of its report.

Dr. WALDSCHMIDT: Second the motion. (Motion duly put and unanimously carried.)

Dr. NACHTWEY: We endorse the secretary's report in whole and wish to call to the attention of the House of Delegates, the following paragraphs:

"Dr. W. F. Braasch of Rochester, Minn., as a member of the national advisory committee of the A. M. A., on Medical Supply, writes us expressing his willingness to help us in any way possible to carry out this national survey; he states that in Minnesota they have already had Dr. Leland, director of the A. M. A., bureau of medical economics, meet with them; that their committee on medical economics has a sub-committee of fifty; that a designated committee will meet with the governor and other state officials for exchange of views. Dr. Braasch advises that coordination of the various activities is carried on through the office of their state secretary.

"The A. M. A. transmits to us a copy of a letter from Governor Murphy of Michigan to President Cook of the Michigan State Medical Association, offering the state's cooperation in the proposed survey. At the same time the A. M. A. notifies us that the medical organization in each state may properly arrange conferences with the governor."

This committee recommends that the committee on medical economics immediately contact the governor to urge the state's cooperation in the furtherance of this investigation of medical supply, to the end that he order all county commissioners to fill in their blanks so that we can have it within sixty days.

We further recommend that the economics committee contact the executive secretary of the State Welfare Board.

Your committee further urges that each local society be instructed at their next meeting to take up the question of medical supply and to cooperate with the American Medical Association to the event that the entire report will be back in the hands of the Medical Economics Committee, who in turn can forward it to the American Medical Association.

Your committee submits this section of its report and moves its adoption.

Dr. CALL: Second the motion. (Motion duly put and unanimously carried.)

Dr. NACHTWEY: Your reference committee respectfully submits its report as a whole and moves its adoption.

Dr. FAWCETT: Second the motion. (Motion duly put and unanimously carried.)

Dr. McCANNEL: Through Dr. Nachtwey's modesty, he didn't tell the full action of the committee, that if we find time on the general program tomorrow, or on the program tonight, that he explain to the doctors assembled the outline of this survey so when they get these blanks, they will know something about it, to facilitate their filing. It is a very important thing in regard to our medical profession, and if this association can find five or ten minutes, Dr. Nachtwey should be given the time to explain this matter.

Dr. SORENSON: I was not a member of the reference committee, but I was present at the meeting. I would like to say a word about this reference committee. I think this association should establish such a committee. As far as I know, we haven't that, and I think it should be established. It demonstrated to me that that is one way to get through our business quickly and accurately. These men take the reports handed them and go into them thoroughly; they spend a lot of time on them, thresh them out, and finally come to a sane conclusion. We have seen many times on the floor that measures have been proposed, seconded, voted on and carried without any discussion; yet some of these measures should have been discussed. If those reports go to the reference committee, they will be thoroughly threshed out before they are finally acted upon. If it is in place here, I would like to make a motion that this House of Delegates establish a reference committee.

Dr. MACGREGOR: Second the motion.

Dr. SORENSON: That will be appointed by the Chair?

Dr. WILLIAMSON: Couldn't that plan be adopted on a number of committee reports?

Dr. NACHTWEY: I might make a suggestion on this: If a reference committee is appointed each year at the first session, immediately there will be various miscellaneous affairs that need to be threshed out, and no extended time can be given here. Just as in this instance, they were handed to the reference committee. Then the members interested in the bills or

resolutions will appear before the committee for consultations and not take up the time of the House of Delegates. The final discussion will come up before the House, after we make our recommendations.

Dr. FAWCETT: Then you have the Chair appoint a committee of three or five at the beginning of the meeting?

President Goss: That should be incorporated in the new constitution.

Dr. LONG: Here is one matter that should have gone to the committee last night. This is a special committee I was on last year. Doctor Williamson talked to the State Pharmaceutical Society at their annual meeting last year and the things he said aroused their interest so much, that at their meeting they had some meetings of their officers, and came to us and talked to, I think, the executive committee, or Dr. Goss. I don't know whether the whole executive committee was present or not. We met at the time of our July meeting of the State Board of Medical Examiners. At that time, it was proposed that some organization might be formed in North Dakota which would coordinate in a loose manner the professions who have mutual interests and thus accomplish some good in matters of public affairs.

This year is a legislative year. This might be one of the times when such a mutual organization, which is not entered into with any great sense of obligation from one to another, could be of mutual helpfulness. In some of our states there exist such societies. In the state of Washington, for instance, there is such an organization which has been in effect and operation for twelve years. It is entirely separate from the medical organization. The dues to it, I think, are \$25 a year, and the membership is composed of dentists, doctors and pharmacists—people who have mutual interests. They hire a paid secretary and really spend money to safeguard their interests.

Now in South Dakota, there is a similar organization, which a few years ago interested itself in legislation, and such matters of public interest, and which incurred or engendered perhaps, the sort of resistance that one might expect. They possibly made too much of it.

This summer, Dr. Arzt, Dr. Skelsey, Dr. Goss and myself, and I think Dr. Larson from Bismarck, met with two members each of the Pharmaceutical, Dental and Nursing organizations. They entered into a proposal of a tentative organization, which I will read to make it clear.

"The name of this organization shall be 'The Council of the Inter-allied Professions of Dentistry, Medicine, Nursing, Pharmacy, Veterinary Medicine and Hospital Administration.'

"The purposes of this council are: to promote the science and the art of the practice of the aforesaid professions insofar as they affect the progress, development, and the practice of the 'healing art' in the state of North Dakota; to lend support to the program of such other health agencies as are in any way engaged in the control or the eradication of any contagion, which endangers human life; to cooperate with such state and government agencies, which have for their purpose the dissemination of public health information, which is designed to improve the standards of living within the commonwealth of North Dakota."

It seemed to us who were present, that that might be a useful article. In the past we have been a member of the Greater North Dakota Association, which has had a paid representative in Bismarck in times of stress, and which some of the men felt had not accomplished for us just all we would like. And of course, there are members in the dental profession and in the pharmaceutical profession who have real influence, where we might not have it, and it was thought it might be beneficial. This is not a binding thing that obligates us in any way except to give our approval. Maybe that is not right, and this should have been submitted yesterday. I am sorry it was forgotten.

Dr. WILLIAMSON: I would move the adoption of the report, Mr. President. At the time I talked to the fellows I didn't think I was going to stir up so much smoke. I move the adoption.

Dr. FAWCETT: Second the motion. (Motion duly put and carried.)

Secretary SKELSEY: May I ask if there is any objection to this report going through the regular transactions and being printed?

Dr. LONG: I think that will be all right.

Dr. WILLIAMSON: Dr. Nachtwey is going to make a talk tomorrow and I wonder if it would not be possible for him to make the report at the banquet, because there is a better attendance there than at the House of Delegates and the regular meetings.

(Some informal discussion followed this suggestion, following which it was decided that Dr. Nachtwey would make his report at the banquet.)

Dr. WILLIAMSON: I move that the House of Delegates adjourn to meet at 11:00 o'clock A. M., May 18, 1938.

Dr. FAWCETT: Second the motion. (Motion duly put and unanimously carried.)

FOURTH MEETING HOUSE OF DELEGATES

The adjourned meeting of the House of Delegates was called to order by President Goss, at 11:00 A. M., on May 18, 1938.

Secretary Skelsey called the roll and declared a quorum present.

The following proceedings were had:

Secretary SKELSEY: May I state this: Dr. Limburg, the delegate from Fargo, has a communication to make, and asks you to change the order of business because he wishes to go to see the film.

Dr. LIMBURG: Mr. President, as the delegate from the Cass County Medical Society to the state society, I have been given authority to invite the state association to meet at Fargo in 1939, next year, so I move that Fargo be designated by the organization as the meeting place for 1939.

Dr. SKELSEY: I wish to read a telegram that was held over from the last session of the House. It is addressed to Dr. Long and states:

"Fargo sends best wishes for a successful meeting and a hearty invitation to the medical society to come here for your next convention. (Signed) W. B. CHESTNUT, Secretary, Chamber of Commerce."

Dr. SIHLER: We want the meeting at Devils Lake next year. It has been eleven years since we have had that opportunity, and as the secretary can well tell us, our organization is one of the strongest component parts of the state organization. We are beautifully situated to take care of the boys, and those who were with us eleven years ago, will all admit that we had a nice meeting. Our registration was right up almost to where it has been at this meeting.

I was talking with Adjutant General Smith last night about a little diversion in entertainment. I think some of you fellows were here when I was talking to him, and their equipment up there is very beautiful and he told us that anything he had there, we could utilize. That is a beautiful situation, a beautiful lake, the bathing is wonderful, and he is going to turn over every assistance he has to make that meeting a success. But above all that, outside of what the physical possibilities are that we have for you, I feel we are entitled to it. The only objection that I encountered last night was the fact that Dr. Long, who will be president next year, would like to have it in Fargo. I contacted Dr. Long and he says he is going to reciprocate with me. When I was president we met in Fargo, and he says that is a beautiful sentiment and he is going to reciprocate and that he would like very much to come up to the Lake. I am here to ask you gentlemen as a favor to come to the Lake.

Dr. FAWCETT: Mr. President, I would like to second the motion of Dr. Sihler of Devils Lake. As a member of the Devils Lake society ever since its inception in 1904, I want to double that invitation. Doctor didn't tell you about the many facilities we have now for entertainment in Devils Lake, that we didn't have then. We have a very fine memorial building that I think is capable of taking care of different sections, just as this building we are in now. We are located in the central part of the state, where we could draw from Fargo, Grand Forks, Minot and Bismarck territories. That isn't true of the eastern cities. I am sure that as a society, although we are not one of the largest societies, we are capable of taking care

of the meeting. I know that Dr. Sihler and myself will pledge to the state association that we will do our darndest to put over a good meeting.

President Goss: Any other applicants for this great honor?

Dr. FORTIN: I second the invitation to Fargo.

Dr. NACHTWEY: I suggest we vote by ballot.

Dr. SIHLER: I suggest you ask Fargo to withdraw.

Dr. Goss: I will appoint as tellers Drs. Williamson, Limburg and McCannel.

(Dr. Johnson of Bottineau made a few informal remarks in behalf of Devils Lake.)

After the ballot was cast, Dr. Williamson announced the results as follows: Fargo, 9; Devils Lake, 7.

Dr. LIMBURG: I want to thank you gentlemen who voted for Fargo. I appreciate all the good things Devils Lake has. I think one of the best meetings I ever attended was at Devils Lake quite a number of years ago. In Fargo, we have all the things Devils Lake has, and a lot more, but we don't have a Sihler.

Dr. SIHLER: I make a motion that we make it unanimous to meet in Fargo.

Dr. FAWCETT: Second the motion. (Motion duly put and carried.)

Dr. Goss: We will now have the election of officers.

Report of Nominating Committee

Dr. SKELSEY: I have been handed the report of the nominating committee, which I will read:

A meeting of the nominating committee was called by Dr. W. C. Fawcett, chairman. The following members of the association were nominated:

President: Dr. W. H. Long, Fargo.

President-elect: Dr. H. A. Brandes, Bismarck.

First Vice-President: Dr. C. J. Glaspel, Grafton.

Second Vice-President: Dr. F. W. Fergusson, Kulm.

Secretary: Dr. W. W. Wood, Jamestown.

Delegate A. M. A. 1939: Dr. A. P. Nachtwey, Dickinson.

Alternate Delegate: Dr. C. E. Stackhouse, Bismarck.

Councillors:

Dr. M. MacGregor, Fargo, First District.

Dr. N. O. Ramstad, Bismarck, Sixth District.

Dr. G. M. Williamson, Grand Forks, Third District.

Recommended as members of the N. D. State Board of Medical Examiners:

Dr. H. A. Brandes, Bismarck.

Dr. W. H. Long, Fargo.

Dr. J. E. Countryman, Grafton.

Respectfully submitted,

Dr. J. W. BOWEN,

Dr. W. C. FAWCETT,

Dr. CHARLES MACLACHLAN.

Dr. FAWCETT: I move, Mr. President, the adoption of the report.

(Several seconds were heard; the motion was duly put and carried unanimously.)

President Goss: Is there any unfinished business? May I ask with regard to the Committee on Crippled Children.

Dr. SORENSON: Mr. Chairman, I handed the report in yesterday, which I think was accepted, but we were to meet Miss Allen, which I did this morning, and I now want to report.

She wants this association, or this committee, or some one to designate the names of the suitable men in the various parts of the state, men residing in places where there are standardized hospitals. They wish some one to designate those capable of handling crippled children's work. She says these specific names have to be handed into Washington. She desired us to name these but, of course, we refused. I don't know how any one can conscientiously pick out men in the various places who would be qualified to do this work. She wants an expression from this House as to what we are going to do; if we are going to hand her a list, or if we will hand in a list of members of the College of Surgeons and let them sift them out. She also suggested that if these names were put up, that they would be sent to the orthopedic surgeons at Fargo, who would again pass on them before they were sent to Washington. She would like to know from this association what we want done—whether we want to present a list of men who we think

would be capable, or whether we will let them select a list from the men that we suggest from the College of Surgeons.

Dr. WILLIAMSON: I move, Mr. President, that this be left to the Committee on Crippled Children. I think the committee is familiar with it, and they should get together and handle the thing in the manner which in their judgment they deem best.

Dr. MACGREGOR: Second the motion.

Dr. NACHTWEY: It will put a burden on the committee. The state department sends out questionnaires to every doctor in the state and he fills in his qualifications, and then it is sent to Miss Allen. We received some the other day. I don't know what the purpose of it is, but these blanks are mailed from Miss Allen's office and the doctor fills in the qualifications. Some of these men feel they are discriminated against, so let the matter rest, or the burden go back where it belongs, upon the individual doctor; let him fill in his qualifications and send it to Miss Allen, for her to pass on it. I make that as a suggestion to the committee.

Dr. SORENSON: This committee expires now. There will be a new committee coming up.

Dr. McCANNEL: I am afraid this action will be right back where we started from. Being a member of the Welfare Board Crippled Children's Committee, I have seen this threshed out many times, and putting it up to the individuals to make the list doesn't work out. What they want is some official action by the state medical association that will conform with the rules and regulations of Washington. We have been trying to work this thing over a year but they won't accept any recommendations of the committee at Washington. We have hospitals designated for over a year qualified to take care of crippled children's work. If you leave it this way, we will be right up against the same thing.

Dr. SORENSON: She suggested that this association, or some one representing us, designate what men are eligible, (they can go as far as they like in that) and that these men be passed on by the men who are already doing the work, and who are qualified—the two orthopedic surgeons.

Dr. McCANNEL: It is putting an awful job on Drs. Harry Fortin and Swanson.

Dr. SORENSON: Yes, I think so, but they want to know what you are going to do.

President GOSS: If there are any doctors in the state who want to do this work, they could send in their qualifications. Wouldn't that help out?

Dr. SORENSON: That is being done now.

Dr. RAMSTAD: I am not prepared to make any recommendations as to what seems the best thing to do, but I know Dr. Brandes and Dr. McCannel have been up against this for a year. I believe Miss Allen wants to be fair, but they want some recommendation from our association as to how this should be handled. They are passing the responsibility to us, and I believe that we should face it. They are going to make recommendations, if we don't make recommendations. I think we should find some practical way of solving the problem. Personally I would like to see a larger meeting of the House of Delegates to discuss this.

Dr. McCANNEL: I think Miss Allen would enlarge the scope of that committee from Dr. Harry Fortin and Dr. Swanson; if this society would designate this Crippled Children Committee as the official body to act for the state association, I believe it could be worked in that way.

Dr. WILLIAMSON: That is my motion. My motion was that the Committee on Crippled Children, who ever they might be, the incoming committee, be designated to act for the association. That will be a small group of fellows interested in this and familiar with what is needed, and whatever action is taken will be abided by.

Dr. McCANNEL: My thought was enlarging that committee rather than leaving it up to Dr. Fortin and Dr. Swanson, and make it the official committee.

Dr. WILLIAMSON: State what you want and I will withdraw my motion.

Dr. McCANNEL: That the present Crippled Children's Committee, consisting of Drs. Fortin, Swanson, Wood and Sorenson, be authorized as the Crippled Children's Committee of the state medical association to pass upon the qualifications of those

to do surgery under the crippled children's program, that they be continued for another year, and be given full authority to act for the association as a whole.

Dr. WHEELON: Second the motion.

Dr. WILLIAMSON: I would add Dr. Waldschmidt's name to that committee, and that will be my motion.

(Motion duly put and unanimously carried.)

Supplementary Report of the Committee on Medical Economics

Dr. H. A. Brandes, chairman, gave the following report:

The committee on medical economics, after having given due consideration to the resolution received from the Southern District Medical Society relative to the pro-rating of March 1938 bills submitted to the North Dakota Farmers Mutual Aid Corporation, recommends to the House of Delegates the following: That the North Dakota State Medical Association forward the request to the Farm Security Administration, through the corporation, that additional funds be allocated, as \$1.00 per month per family does not yield a sufficient sum to cover the cost of treatment under the present program.

In view of the action of several welfare boards to arbitrarily set up fee schedules different from the one adopted by the North Dakota State Medical Association on November 19, 1933, the committee recommends that such fee schedule be rejected by the component societies. The committee further recommends to the House of Delegates that there be no reduction of the present medical relief fee schedule as such action will inevitably lead to inadequate medical care. We would urge that the members of the association continue to give their fullest cooperation to welfare agencies in an endeavor to keep down the cost of medical care to relief clients.

Dr. BRANDES: I move the adoption of this report.

Dr. NACHTWEY: Second the motion. (Motion duly put and carried unanimously.)

Secretary SKELSEY: May I ask Dr. Brandes if it is his wishes that the House of Delegates express this officially.

Dr. BRANDES: Yes.

Dr. SORENSON: I would like to ask the secretary to send Miss Theodora Allen, who is in charge of this division of Child Welfare, this resolution that was adopted yesterday, and send it right away because she is holding her report to send it into Washington, and wants this before. Possibly it would be well to send a copy of the motion made this morning so she will know she is dealing with somebody who has been authorized.

Dr. ARZT: The thought has occurred to me in connection with the crippled children, that this committee has to meet. They are spread around in the corners of the state. There is going to be some expense in connection with that. There wasn't any suggestion made yesterday in regard to any expense outside of two committees.

Dr. SORENSON: We have to meet this year, and they want a meeting here at the Capitol quite soon.

Dr. BRANDES: Before you get away from this report that I presented, I would like to have the House of Delegates take some action on that, instructing the president or secretary to write to the Farm Security Administration and also to the Welfare Board.

Dr. WALDSCHMIDT: I make that as a motion.

Dr. WILLIAMSON: Second the motion. (Motion duly put and carried unanimously.)

President GOSS: I want to thank this group for the way you have conducted the meeting, and the manner in which you have treated me.

Secretary SKELSEY: Am I not instructed to thank the Sixth District for the very fine meeting they have given us?

Dr. WILLIAMSON: I make a motion that the secretary be instructed to write such a letter.

Dr. NACHTWEY: Second the motion. (Motion duly put and unanimously carried.)

A motion was duly made, seconded and carried that the meeting adjourn *sine die*.

Committee on Necrology

Dr. James Grassick, chairman of the necrology committee,

submitted the following report subsequent to the annual meeting:

*"Time, you old gypsy man,
Will you not stay,
Put up your caravan
Just for a day?"*

Thus ran the old ballad, but in spite of entreaties, "Time marches on." Let us reverently pay our tribute of memory to those of our number who, since last we met, have made the grade.

Obituaries of Dr. Thomas Mulligan and of Dr. John E. Engstad, both of Grand Forks, N. D., have appeared in previous issues of THE JOURNAL-LANCET.

ANDREW EKERN, M.D.

Dr. A. Ekern was born in Norway in 1865 and died in San Diego, California, October 29, 1937. He came to America with his parents and lived most of his early life in Wisconsin. He received his medical degree from Rush Medical College in 1887. He began practice at Hatton, North Dakota, and later removed to Wisconsin. He returned to Grand Forks, North Dakota, in 1892, and after engaging in general practice for sometime he spent two years in Berlin, Vienna and London, where he made intensive studies of eye, ear, nose and throat. He returned to Grand Forks, North Dakota, in 1895, and confined his work to his chosen specialty for the ten following years, and was the first physician in the state to establish such a practice. In later years he removed to San Diego, California, where he spent the remainder of his life.

Dr. Ekern was prominent in Masonry and was the recipient of the highest honors in the gift of the order. As a physician, he made an enviable reputation for skill and judgment, and drew his patients from a wide area.

Dr. Ekern was always the clean-cut gentleman, courteous and generous, and ever ready to give the best he had for the relief of those committed to his care. He leaves a wife, a son and a daughter.

JAMES W. VIDAL, M.D.

Dr. J. W. Vidal died October 5, 1937. He was a graduate of the Homeopathic Medical Department of the University of Michigan, Ann Arbor, in 1882. He practiced in Valley City, Barnes County, for a number of years and then removed to Fargo, North Dakota, where he remained until the time of his death. Although of homeopathic tendencies, he utilized "regular" means and methods in his practice and was generally regarded as an honorable and conscientious practitioner.

ANDREW JOHN HEIMARK, M.D.

Dr. A. J. Heimark died Sept. 17, 1937, in Fargo, North Dakota. He was graduated from the College of Physicians and Surgeons, Chicago, Illinois, in 1904, and was admitted to practice in North Dakota July 13, 1905. He settled in Finley, Steele County, where he practiced his profession until 1924, when he removed to Fargo, North Dakota. In the latter city he remained until the time of his death. He is survived by his wife and two children.

ELMER OSCAR STEEVES, M.D.

Dr. E. O. Steeves was born in Dover, New Brunswick, Feb. 25, 1877, and died at Rugby, North Dakota, Nov. 19, 1937. He was graduated from McGill Medical College, Montreal, Canada, in 1903. He was licensed in North Dakota July 13, 1905. He practiced in Nova Scotia for two years, and on coming west settled at Berwick, North Dakota, and later moved to Rugby, where he lived until his death. For ten years he was in partnership with Dr. A. M. Call. He was a staff member of the Good Samaritan Hospital and was generally regarded as a physician of ability and skill. He is survived by his widow and one daughter, Mrs. John Smith, of Rochester, Minnesota. He leaves a worthy record of unselfish service.

JOHN D. LEITH, M.D.

Dr. J. D. Leith, aged 76, a native of Ontario, passed away at his home in McCreary, Manitoba, Dec. 14, 1937. He was a graduate of Ottawa, Ontario, Normal School and of Trinity Medical School, Toronto, Ontario, where he received the M.D.; C.M. degree in 1894. He was licensed in North Dakota July 14, 1897. He practiced respectively at Milton, Inkster, Petersburg and Larimore, North Dakota, and for the

past twenty-one years at McCreary, Manitoba, where he was in the employ of the government as municipal health officer, the first in western Canada. He was a member of the Presbyterian Church, and held membership in several Masonic bodies. He was a pioneer and loved the open spaces and unspoiled frontiers, and brightened many a prairie home in times of stress. He is survived by his widow; a daughter, Mrs. R. B. Witmer, Grand Forks; a son, Professor Douglas Leith of Columbia University; and a sister and three brothers in Ontario.

GEORGE SHERYL CABOT, M.D.

Dr. G. S. Cabot, aged 37 years, died at Jamestown, North Dakota, December 16, 1937. He was graduated from the University of Minnesota Medical School in 1925, and practiced in Minneapolis until coming to North Dakota two years ago, where he was identified with the Depuy and Sorkness Clinic of Jamestown. He held a commission of Lieutenant Commander in the Naval Reserve Officers Corps.

Physicians have always kept themselves in the background and it is seldom indeed that we hear of heroic deeds done by them. Dr. Cabot, unwittingly, was given wide acclaim in an incident that happened while on a hunting trip in northern Minnesota in the early winter of 1932. A forest patrolman brought word to his camp that a Finnish woman some thirty miles distant was badly in need of medical care. Dr. Cabot made the trip in sub-zero weather, gave emergency treatment, and superintended her removal to the Two Harbors hospital for an operation. The patient's welfare is the first consideration of the ethical doctor, and personal comfort, convenience and monetary reward are secondary and incidental. Dr. Cabot was a physician of great promise and his untimely demise was a distinct loss to the medical profession of the state. He leaves a widow and two sons.

HAMILTON EMANUEL, M.D.

Dr. H. Emanuel, aged 80, died Jan. 4, 1938. He was a graduate of Fort Wayne College of Medicine, Fort Wayne, Indiana, in 1880, and was registered in North Dakota Nov. 24, 1886. He had been in active practice 58 years, 53 of which were in North Dakota, entitling him to a place among the real pioneers. He was actively engaged in professional work up to the time of his death. His day's work was centered in Milnor, North Dakota, and in the early days he traveled far and wide dispensing relief and comfort to a sparsely settled community. With him the family was the unit of service and many a settler had reason to bless his name, not only for his professional services, which were always the best he had to offer, but for his wise counsel on social and economic problems incident to a new country. To such as he the profession of medicine and the country at large owe a debt of gratitude for services rendered under adverse conditions and for work well done.

OLE A. BEAN, M.D.

Dr. O. G. Bean was born in Illinois, March 30, 1869, and died at his home at Casselton, North Dakota, Feb. 2, 1938. He was graduated from the University of Iowa in 1898, and was licensed in North Dakota Jan. 14, 1904, from Ward county. He practiced in Iowa, Wisconsin and North Dakota; the past two years he was in Casselton, North Dakota. He is survived by a wife, a son, a daughter and four grandchildren.

C. J. MCGURREN, M.D.

Dr. C. J. McGurrien died March 11, 1938, at Devils Lake, North Dakota. He was born in Eagle, New York, and came with his parents to Cass County, North Dakota, before statehood; grew up on a farm, and made his way to honorable positions in the profession he loved. He received his M.D. degree in 1904, and was licensed the same year in North Dakota and began practice at Larimore, North Dakota. Here he resided for four years and then moved to Devils Lake, where he remained until his death.

Dr. McGurrien was a gentleman of fine bearing and was named as colonel on the staffs of Governors Hanna, Frazier, Welford and Langer. He was public-spirited, and gave much of his time to community projects. He served as city and county health officer for several years and was recognized by the state with the appointment Superintendent of Health. This position he held for eight years (1913-1921). Dr. McGurrien was a fine type of progressive physician, and through graduate

courses and well directed reading he kept abreast of advanced medical thought. He was prominent in church work and was for a time State Grand Knight of the Knights of Columbus. He is survived by his widow (sister to Governor Langer), a son and a daughter.

CARL AUGUST WICKLUND, M.D.

Dr. C. A. Wicklund graduated from the old National Medical University in Chicago in 1906, and was licensed in North Dakota April 11, 1907. He practiced in Wildrose, Williams County, North Dakota, until 1932, at which time he removed to his farm at Castle Rock, Washington, where he died Jan. 30, 1938, at the age of 62.

RALPH J. CRITCHFIELD, M.D.

Dr. R. J. Critchfield was born at Hunter, North Dakota, Sept. 17, 1889, and died at St. Cloud, Minnesota, May 3, 1938. He was the son of a prominent pioneer physician, the late Dr. L. R. Critchfield, who came to North Dakota in the early eighties.

Dr. Critchfield was graduated from the University of Minnesota in 1922, and was licensed in North Dakota, July 7, 1922. He practiced at Maddock, North Dakota, for four years and later at Fessenden, North Dakota. He moved to Fargo, North Dakota, in 1932, to take over the practice of Dr. Wm. Hutchkiss, where he remained until stricken with the malady that sent him to the hospital for relief. He enlisted in the Army Medical Corps and after graduation served his internship in the Northwestern Hospital in Minneapolis. Of his four brothers, L. R. Critchfield is a physician in St. Paul; Harry Critchfield, director of Indian agriculture, Interior Department, Washington; Burke H. Critchfield, vice-president, Bank of America at San Francisco; and McLain Critchfield in the Veterans Hospital, Knoxville, Iowa. He was prominent in golf circles and an enthusiastic sportsman. He leaves a wife and five children, three boys and two girls.

JOHN ROY MCKENZIE, M.D.

Dr. J. R. McKenzie was born in County Kent, near Chatham, Ontario, April 19, 1880, and died in St. Paul, Minnesota, April 10, 1938. He received his academic education in his native country and was graduated in medicine from the Detroit College of Medicine in 1906; he was licensed in North Dakota, July, 1907. After graduation he interned in hospitals in Detroit and Toronto and then came to New Rockford, North Dakota, where he was associated in practice with Dr. Chas. MacLachlan. Here he continued to reside until the time of his last illness. He was elected as Coroner for Eddy County, and held the position for many years. He was also a past president of the Tri-county Medical Society. Dr. McKenzie was independent, honest, honorable, thrifty and dependable. He was a type of the true sportsman, enthusiastic and eager to win, but always fair with his opponent. He excelled in baseball, skating and golf, and did much to foster these outdoor sports in the community. He is survived by his wife and six children.

JOHN LEWIS LIVINGSTON, M.D.

Dr. J. L. Livingston, aged 87, died in Long Beach, California, December, 1937. He was a native of Hamilton, Ontario, and a graduate of the University of Michigan class of 1883. He was licensed in North Dakota, March 10, 1907, and practiced at Inkster, North Dakota, for a time. He later became a government physician at Fort Belknap Indian Reservation, Harlem, Montana. In 1926 he retired and spent the remainder of his days in Long Beach, California. He is survived by two daughters and two sons.

AMOS A. FLATEN, M.D.

Dr. A. A. Flaten, aged 73, a pioneer physician of our state, passed away at his home in Edinburg, North Dakota, April 23, 1938. He was graduated from the Minneapolis College of Physicians and Surgeons, March 28, 1890, and was admitted to practice in North Dakota May 14 of the same year. He located at Park River, but later moved to Edinburg, where he remained until his death. He was regarded as a careful and painstaking physician, a type of the old family doctor, beloved by the people he so well and so long served. He was honored by being appointed superintendent of the State Board of Health, a position he held for two successive terms from 1897 to 1901. He faithfully performed the tasks that were allotted to him.

JOHN CRAWFORD, M.D.

Dr. John Crawford was born at Orangeville, Ontario, February 24, 1872, and passed away at his home in New Rockford, North Dakota, May 23, 1938. He received his preliminary education in Toronto, Ontario, matriculated from McGill University and was graduated with honors from Toronto University in 1894. He interned immediately afterwards in Toronto General Hospital and was then licensed to practice in Ontario. He was licensed in North Dakota, April 15, 1896, and practiced for varied periods at Moorhead, Minnesota, Fessenden, North Dakota, Esmond, North Dakota, Lethbridge, Alberta, and New Rockford, North Dakota, where he remained until his death.

Dr. Crawford was president of the North Dakota State Medical Association in 1930. He was a real progressive in medicine, as well as in economics. He kept himself fully abreast of advanced medical thought by taking graduate courses at the leading medical centers as opportunities offered. For several years he held the position of President of the Advisory Council of the State Department of Health. Dr. Crawford had in him the blood of chieftains, warm and restless at times, but tempered by the endearing qualities of sympathy, kindness and geniality. He leaves a wife, one married daughter, and two sons in the middle of their college careers. The passing of Dr. John, the name by which he was known among his friends, leaves a gap not easily filled.

PROCEEDINGS OF THE COUNCIL OF THE NORTH DAKOTA STATE MEDICAL ASSOCIATION 1938

First Meeting

Monday, May 16, 1938

The first meeting of the Council was held in the Memorial Building, Bismarck, North Dakota, and was called to order by the president, N. O. Ramstad, M.D., Bismarck.

Members present: Drs. N. O. Ramstad, M. MacGregor, A. R. Sorenson, John Crawford, P. G. Arzt, A. E. Spear, F. W. Fergusson and G. M. Williamson.

Minutes

Moved and seconded that the minutes of the Council as published in THE JOURNAL-LANCET, August, 1937, be approved and adopted. Carried.

Dr. Ramstad reported on the case of Dr. Wheeler, Mandan, that after conference with Dr. Wheeler and members of the Sixth District Medical Society, all difficulties had been adjusted satisfactorily and that Dr. Wheeler was now a member of the local society.

Report of Auditing Committee

Drs. Fergusson and Sorenson, auditing committee, reported that an examination of the accounts of Treasurer Wood and Secretary Skelsey show that they are correct.

A motion was duly made by Dr. MacGregor, seconded by Dr. Spear, that the report be accepted and filed. Carried.

Re: Bonds for Treasurer and Secretary

Moved by Dr. MacGregor, seconded by Dr. Spear that bonds for Secretary and Treasurer were considered unnecessary. Carried.

Re: THE JOURNAL-LANCET

Mr. Cohen, publisher, made statements concerning operative policy, particularly as to advertising material offered and accepted. All advertising is subject to inspection and approval of a committee consisting of Drs. Meyers, White and Hayes. Several councillors spoke in terms of approval of THE JOURNAL-LANCET's policy and commended the publisher and thanked him for donating the programs for this meeting.

Moved by Dr. Spear, seconded by Dr. Sorenson that an amount not to exceed \$200 be allowed both the Committee on Economics and Committee on Public Relations. Carried.

Moved by Dr. Sorenson, seconded by Dr. Arzt that the usual amount of \$200 be allowed the local society to assist in paying expenses of state meeting. Carried.

A motion was duly made, seconded and carried that the meeting adjourn until the following day.

Second Meeting

When the Council re-convened on May 17th, 1938, the following members were present:

Drs. Ramstad, MacGregor, Arzt, Spear, Sorenson and Williamson.

Moved by Dr. MacGregor, seconded by Dr. Spear that an amount not to exceed \$200 be allowed President Long to be used to pay expenses of such committees as he deemed advisable. Carried.

Moved by Dr. Sorenson, seconded by Dr. Fergusson that \$100 be allowed the Committee on Radio to pay expenses of obtaining material, and expense of secretary of committee. Carried.

Election of Officers

Moved by Dr. Arzt, seconded by Dr. Spear that Dr. N. O. Ramstad be elected president, and Dr. G. M. Williamson be elected secretary. Carried.

The following Councillors were elected by the House of Delegates:

Physician	Term Expires
M. MacGregor, M.D.—First District	1941
G. M. Williamson, M.D.—Third District	1941
N. O. Ramstad, M.D.—Sixth District	1941
There being no further business, the Council adjourned.	
GEORGE M. WILLIAMSON, M.D., Secretary.	

PROCEEDINGS OF THE GENERAL MEETING of the NORTH DAKOTA STATE MEDICAL ASSOCIATION 1938

First Day

Tuesday, May 17—Morning

The first general meeting was called to order at 8:30 A. M. at the Memorial Building, Bismarck, with President E. L. Goss, M. D., Carrington, presiding.

Dr. O. C. Gaebe, president of the Sixth District Medical Society, extended a welcome on behalf of the host district.

Mayor Obert A. Olson, Bismarck, extended a welcome on behalf of the city.

President Goss responded to the addresses of welcome as follows:

President Goss: As president of the North Dakota State Medical Association, I take great pleasure in accepting your most cordial invitation to your city of Bismarck, a pioneer city, with so much past and present historical background, of military, political and social activities, of cultural and intellectual achievements. We hope to bring you something worthwhile for your entertainments and generous welcome.

Following the Presidential Address, Dr. Goss introduced Dr. A. D. McCannel, who was the presiding officer until the close of the morning session.

Prof. F. W. Schlutz, M.D., chairman, Department of Pediatrics, University of Chicago, discussed in an interesting manner the subject "Infant Feeding."

A recess of forty-five minutes was taken to allow the members an opportunity to view the exhibits.

A mimeographed pamphlet was distributed, citing some obstetrical cases, which Dr. William F. Mengert, Department of Obstetrics and Gynecology, University of Iowa, discussed in an informal manner.

The meeting adjourned at 12 M., to reconvene at 2:40 P. M., with Dr. C. J. Glaspel, presiding.

A symposium in pediatrics followed, when Dr. F. W. Schlutz, chairman, Department of Pediatrics, University of Chicago, presented a paper on "Prevalence of Deficiency Diseases."

A discussion ensued, with the following subjects being presented:

"Vitamin A Deficiency," Dr. Ralph Pray, Fargo.

"Vitamin B Deficiency," Dr. J. L. Conrad, Jamestown.

"Vitamin D Deficiency," Dr. P. H. Woutat, Grand Forks.

A twenty-minutes recess was taken to view the exhibits.

Dr. Bernard Fantus, Department of Pharmacology, University of Illinois, distributed a pamphlet entitled "Some Useful Prescriptions of Internal Use." This he enlarged upon by giving additional prescriptions on a blackboard, discussing in an extremely interesting manner the use of various analgesics.

The meeting adjourned at 6:00 P. M., to re-convene at 9:00 A. M., May 18, 1938.

Evening Session

At 7:00 P. M., the annual banquet was held at the Silver Ball Room, Patterson Hotel, following which an informal program was given, Dr. B. S. Nickerson, presiding.

SECOND DAY

Wednesday, May 18—Morning

The association re-convened, and was called to order at 9:00 A. M., with President Goss in the chair. He introduced Dr. J. H. Moore, who was the presiding officer for the morning session.

Dr. Paul J. Breslich, Minot, North Dakota, presented the subject "Pulmonary Embolism" in an interesting manner.

A discussion ensued, participated in by Dr. J. C. Fawcett of Devils Lake.

A symposium in obstetrics was conducted as follows:

Dr. W. F. Mengert, Department of Obstetrics and Gynecology, University of Iowa, discussed the subject, "Puerperal Sepsis."

Dr. C. D. Owens, New Rockford, read a paper on "Ectopic Pregnancy."

A recess of thirty minutes was allowed to view the exhibits, following which the members adjourned to the Bismarck Theatre to witness a showing of the film, "Birth of a Baby."

The afternoon session convened at 1:45, with Dr. Goss occupying the chair. He thanked the members for the privilege and honor bestowed upon him, which enabled him to act as their president during the past year. He then presented the state association with a beautiful gavel made from various woods, and next introduced the new president, Dr. W. H. Long, Fargo. Dr. Long responded by thanking the members for giving him the opportunity to serve them during the following year, and on behalf of the association expressed appreciation for the gavel. President Long presided during the remainder of the afternoon session.

An interesting and enlightening paper entitled "Medical Relief in North Dakota" was presented by E. A. Willson, executive director, Public Welfare Board of North Dakota.

Dr. Ernest Sachs, professor of clinical neurological surgery, Washington University, St. Louis, discussed the subject, "Head Injuries."

"The Diagnosis of Acute Abdominal Conditions" was thoroughly analyzed by R. W. McNealy, M.D., associate professor of surgery, Northwestern University.

Dr. Albert M. Snell of Rochester, Minn., gave an interesting presentation of the subject "Problems in the Diagnosis and Treatment of Cholelithic Disease."

At 5:00 P. M., a drawing for prizes was conducted; the prizes were donated by the various exhibitors.

The Fifty-first Annual Session of the North Dakota Medical Association adjourned at 5:15 P. M.

Under the Scientific Program, a special assembly was conducted by the Academy of Ophthalmology and Otolaryngology, with President H. P. Rosenberg, M.D., presiding.

At 1:30 P. M., May 17, 1938, the meeting was called to order in the Memorial Building.

Dr. Ernest Sachs, professor of clinical neurological surgery, Washington University, St. Louis, read a paper on "Some of the Ocular, Otorological and Rhinological Symptoms of Brain Tumor," which was illustrated by the use of slides.

Dr. Fred A. Figi, Rochester, Minnesota, discussed the subject "Tumors of the Larynx" using some motion pictures and case reports, which composed an interesting presentation.

On Wednesday morning at 9:20 with Dr. E. P. Quain presiding, the following program was conducted:

Dr. Albert M. Snell, of Rochester, Minnesota, presented in an interesting manner the topic "Recent Studies on Obstructive Jaundice and its Complications."

"Management of Blood Vessel Injuries and Their Sequelae" was discussed by Dr. R. W. McNealy, associate professor of surgery, Northwestern University.

The meeting adjourned at noon to enable the members to participate in the general assembly.

Presidential Address

Edwin L. Goss, M.D., Carrington, North Dakota

To the officers and members of the North Dakota State Medical Association:

It becomes my duty as your president on this fifty-first anniversary of organized medicine in North Dakota, to give an account of my stewardship, to express as briefly as may be, my conception of trends within our profession, and to make such observations and recommendations as seem pertinent and relevant.

At the outset, I wish to express my appreciation for the honor that has been conferred upon me, the highest in the gift of the association. I am not unmindful of the fact that the office implies duties as well as responsibilities, and these I have tried to coördinate for the best interests of the profession. The work may have been irksome at times, as any worthwhile work must of necessity be, but by the fine spirit of helpfulness and coöperation on the part of my fellow officers, it has been a pleasure and satisfaction. If my administration has resulted in a forward movement, credit must be given to the members of the various committees who have so generously given of their time and talents for the good of the professions; and to those, individually and collectively in behalf of the association, I tender thanks. To the Examining Board, I especially say thank you for the invitation to sit in on the Board. It was a pleasure to witness their excellent work.

This is called the machine age, and rightly so, but it is more than that. It is superlatively the Man Age, and many of our social and economic ills are its direct progeny. Science has gone with such pace that the social order has failed to take up the slack, with the result that unemployment, with all its forbidden spectre, stalks everywhere. Preventive, corrective and curative medicine has been responsible for such a saving of human life (from infancy to middle age and beyond) thus verily creating a surplus, a surplus that has been carried over to the active, working, earning home-making period, that industry has been unable to fully absorb it. This is a condition that is largely of our own making, and in justice to society, we should be willing to assume our share of the responsibility, and endeavor insofar as in us lies, to do our bit for the solution of their most irritating problems.

This is a matter we can not evade, if we would, for it permeates every corner and crevice of our social structure, and knocks for recognition at our very doors. Since, therefore, we cannot stand aloof, we should courageously face the situation, and its proper solution; be leaders rather than followers. By active participation we may be able to shape policies, direct courses of action, and control activities that may have a direct bearing on our professions; and at the same time, be of lasting benefit to the people whom we unselfishly serve.

In this connection, it might not be amiss to proffer our good offices to those in authority when the matter of appointment to positions of trust and responsibility, involving medical qualifications, experience and efficiency, are under consideration. If such were accepted in good

faith, it would go far in furthering the cause of good government and enhance the influence of the medical profession.

Organization and coöperation are the key notes to success in any avenue of human endeavor, and this is especially so as society becomes increasingly complex. Never was this more in evidence than at the present time when regimentation meets us at almost every turn of the road. With charlatans and incompetents clamoring for recognition, with those in our own ranks seeking short cuts to success by neglecting to comply with recognized ethical standards, we need to stand together as never before, and put up a solid front against those forces that would weaken our structure, lessen our influence, or undermine our organization.

We elect our officers to whom we delegate specific duties, but they are powerless to proceed unless backed up by a strong professional sentiment. The man on the firing line, the rank and file of our profession are the ones to whom organization means the most, and they in turn should pledge loyalty to their leaders, and to the cause they represent. By demonstrating a willingness to serve, by collecting and furnishing evidence of malconditions or unethical practices, and by otherwise holding up the arms of those who are directing the campaign, they can assure a great forward movement.

It is a far cry from medicine of our fathers to the practice of today, with all it can have of groups, clinics, and specialties; and it may be that the profession in its eagerness to forge ahead has outstripped the masses who tenaciously cling to the memories of the days of the family physician, of all they had of close fellowship, sympathetic helpfulness, and deep concern; under these conditions, it is but natural to hear, now and then, a "back to Egypt" cry. This we have in any great forward movement. In periods of unrest, such as we are now experiencing, with socialized medicine in the offing, and with its advocates clamoring for expression, it would seem the part of discretion to look well to our ancient land marks before committing ourselves to any dubious untried lines of action. We have taken certain forward steps, as all progressive organizations must do. We have taken possession and we must occupy. In dealing with those who think differently than we do, it becomes our duty to act sympathetically, yet firmly, with those who from various causes have neglected to keep step with the times; to encourage the timid and the faltering, and lend a helping hand to the weak and helpless, and put up a solid front against those who would wilfully do us injury.

It is a condition that requires careful planning, wise management and discriminating leadership; if we continue as a profession to make the welfare of the patient our chief concern, and the common weal our main objective, we may well afford to stand by our colors, meriting and receiving the approbation and support of the better element of society.

A year ago we celebrated the fiftieth anniversary of the organization of our association, with an hour of fitting service, in which we did honors to the pioneers

who laid the foundation for future growth and development. Today we begin a new half century of achievement, and it develops upon us as representatives of a great profession to show ourselves worthy of the legacy that has been bequeathed to us.

Let us grasp the torch of truth, hold it high, and bear it on, that the great enemies of our race, ignorance and superstition, may give way before the advancement of knowledge and understanding. This is our task and this is what we have set ourselves out to accomplish.

I had been asked: "what are you going to say about 'state medicine'?" My reply was concise and comprehensive, and pointed out that the situation must be squarely met, dealt with as follows: There is not much that can be done offensively, and less defensively, unless we set our own house in order; adhere more strictly to the tenets, to the oath of Hypocrates; put in practice the Golden Rule; imbibe more of the spirit of the Good Samaritan, that inspired the pioneer practitioner of half a century ago in our own middle west.

What can our forces of four hundred, with almost as many divergent remedies do to stem the tide that threatens to overwhelm us, against an array of battalions of national organizations, all in one mind that their methods of caring for human ills are economically, philanthropically, and humanly superior to ours?

The Red Cross, international in character, and a mighty contending force, occupies the front center of the attacking column; the federal securities corporation is the "right wing"; the WPA the "left wing". A great host of camp followers, such as the National Tuberculosis Association, County Welfare Boards, and almost innumerable organized health units are pushing their way to reach the front lines of attack on our vacillating and bewildered group.

The unvarnished truth is that we can do little to stem and but little to repel the attack with our organization, unless we have full coöperation, are close and determined, locally, state and nationally, and present a united front. My personal belief is that until we can meet the formidable attacking force, we invite defeat and disaster to our cause.

For service to the public at large, the general practitioner is still and always will be the indispensable trunk of the professional tree; the specialists are the branches and off-shoots that have been nourished and sustained by the root trunk, but what recognition, substantial or otherwise, is afforded him by those who thrive on the

general practitioner's magnanimity in referring patients to them. Is there no help for "The Widow's Son"? True the Red Cross furnished the eye specialist with corrective and operative cases; the orthopedic with bone and joint cases; the intrepid surgeon with brain and kidney cases; but the obstetrician and internal medicine specialists, who are closest to the parent trunk, receive little recognition from the Federal treasury.

If you are ambitious to erect a lasting memorial to the medical profession of North Dakota, why not center your activities on the Medical School, together with a circulating medical library, and physiological and pathological laboratories? North Dakota is but seventy years old and has a well organized Medical School, and although North Dakota is going through a depression now, when she finds herself, she will make good and will look with pride to what she fostered during the lean years of her early life.

In regard to the School of Medicine of the University of North Dakota, it should be supported by the state so it will be able to meet the demands of the various rating bodies and the clinical schools that may take its students as they wish to transfer, because:

1. It affords well qualified young men of the state, who desire to prepare themselves for the practice of medicine, an opportunity to secure a considerable part of their required training near at home and at moderate expense.

2. It affords an opportunity to the types of young men who because of racial stock and social and economic background are the most desirable from which the profession can be recruited.

3. It is the part of an effort that should be made to conserve for the state a reasonable share of the future ability, strength and leadership of those who are now its youth.

4. It is highly desirable for the University, as a whole. The number involved in the School of Medicine proper is, of course, limited and comparatively few; but the fact remains that a well conducted and approved School of Medicine as a part of the University is also a factor of enhancing the standard of the University at home and abroad.

5. It has been able to do satisfactory work in its special line as indicated by the success of its former students in transferring to other schools, in writing examinations of the National and State Boards and in practice.

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Carpenter, G. S. Jamestown

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Holt, G. H. Jamestown

Karterman, M. R. Lake Williams

Longstreth, W. E. Kensal

Lorenzen, F. C. Jamestown

Matthaei, Pearl V.

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Melzer, S. W. Woodworth

Nierling, R. D. Jamestown

Peake, Francis M. Jamestown

Peterson, D. Jamestown

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Carr, A. Minot

Carr, A. M. Minot

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Goss, E. L.	Carrington	Limburg, A. M.	Fargo	Pierce, W. B.	Bismarck
Graham, J. D.	Devils Lake	Lipp, G. R.	Bismarck	Platou, C. A.	Valley City
Grams, L. R.	Minot	Little, Ethel E.	Minot	Pray, E. A.	Valley City
Grangaard, H. O.	Ryder	Little, R. C.	Mayville	Pray, R. E.	Fargo
*Grassick, James	Grand Forks	Lohrbauer, L. T.	Grand Forks	Quale, V. S.	Grand Forks
Greene, E. E.	Westhope	Long, W. H.	Fargo	Quain, E. P.	Bismarck
Greengard, M.	Cando	Longstreth, W. E.	Kensal	Quain, F. D.	Bismarck
Griebenow, F. F.	Bismarck	Lorenzen, F. C.	Jamestown	Radl, R. B.	Bismarck
Grinnell, E. L.	Grand Forks	Lyle, W. D.	Havana	Rainville, S.	Crosby
Gumper, A. J.	Dickinson	Lynde, Roy	Ellendale	Ramstad, N. O.	Bismarck
Gumper, J. B.	Belfield	Lyons, M. W.	Wibaux, Mont.	Rand, C. C.	Crystal
Haagenesen, E. C.	Grand Forks	McCannel, A. D.	Minot	Ransom, E. M.	Minot
Halliday, A. B.	Hebron	McGouvern, T. E.	Velva	Rasmussen, F. P.	Beulah
Halliday, D. J.	Kenmare	McGee, W. J.	Flaxton	Reed, P.	Rolette
Halverson, H. L.	Minot	McQueen, W. W.	Langdon	Reichert, H. L.	Dickinson
Hamernek, F.	Elbow Woods	Macdonald, A. C.	Valley City	Reiswig, A. H.	Wahpeton
Hammargren, A. F.	Harvey	Macdonald, A. W.	Valley City	Ribble, G. B.	LaMoure
Hanna, J. F.	Fargo	Macdonald, J. A.	Cando	Rice, P. F.	Solen
Hanson, G. C.	Minot	MacGregor, M.	Fargo	Richter, E. H.	Hunter
Hardalson, O.	Minot	MacLachlan, Chas.	New Rockford	Rindlaub, E. P.	Fargo
Hardy, N. A.	Minto	Maercklein, A. G.	Ellendale	Roan, M. W.	Bismarck
Haugen, C. O.	Larimore	Maercklein, O. C.	Mott	Robertson, C. W.	Jamestown
Haugen, H.	Fargo	Mahon, Ruth M.	Grand Forks	Rodgers, R. W.	Dickinson
Haugrud, E. M.	Fargo	Mahowald, R. E.	Grand Forks	Rollie, C. O.	Drake
Hayhurst, J. O.	Rolette	Malvey, K.	Bottineau	Rose, N. J.	Finley
Haynes, G. H.	Lisbon	Matthaei, D. W.	Fessenden	Rosenberger, H. P.	Bismarck
Heffron, M. M.	Dickinson	Matthaei, Pearl V.	San Antonio, Texas	Rostel, H.	Fargo
Heinzroth, G. E.	Turtle Lake			Roth, J. H.	Jamestown
Henderson, R. W.	Bismarck	Mattson, R. H.	McVille	Rothnem, T. P.	Fargo
Hendrickson, G.	Enderlin	Mazur, B. A.	Fargo	Rowe, P. H.	Minot
Hetherington, J. E.	Grand Forks	Meadows, R. W.	Carrington	Ruud, H. O.	Grand Forks
Hetzler, A. E.	Mandan	Melzer, S. W.	Woodworth	Ruud, M. B.	Grand Forks
Hill, S. W.	Regent	Meredith, C. J.	Valley City	Rystad, O. H.	Grand Forks
Hillis, S. J.	Berthold	Merrett, J. P.	Marion	St. Clair, R. T.	Bowbells
Hjelle, C. A.	Portland	Meunier, H. J.	Oakes	Salvage, F. E.	LaMoure
Hoepfer, P. G. E.	Williston	Miller, H. H.	Wahpeton	Sand, O.	Fargo
Hofto, J. M.	Grand Forks	Miller, H. W.	Casselton	Sasse, E. G.	Lidgerwood
Holt, G. H.	Jamestown	Miller, J. P.	Grand Forks	Savre, M. T.	Northwood
Horsman, A. T.	Devils Lake	Miller, S.	Ellendale	Schatz, G.	West Fargo
Hoskins, J. H.	Wahpeton	Moffatt, G.	Crosby	Schoregge, C. W.	Bismarck
Hunter, G. W.	Fargo	Monteith, G.	Hazelton	Schumacher, N. W.	Hettinger
Huntley, H. B.	Kindred	Moore, J. H.	Grand Forks	Schwinghamer, E. J.	Grenora
Irvine, V. S.	Park River	Moore, Will H.	Valley City	Sedlacek, B. B.	Fort Totten
Itkin, P.	Tolley	Morris, A. C.	Fargo	Sedlak, O. A.	Fargo
Ivers, G. U.	Fargo	Morris, V. G.	Beach	Seibel, L. J.	Harvey
James, J. B.	Page	Moyer, L. B.	Carson	Seiffert, G. S.	Minot

Shepard, W. B.	Linton	Thompson, R. C.	Wilton	Weible, R. E.	Fargo
Sherman, C. H.	Oakes	Timm, J. F.	Makoti	Westervelt, A. E.	Bowdon
Sihler, W. F.	Devils Lake	Tompkins, C. R.	Grafton	Westley, M. D.	Cooperstown
Sinner, B. L.	Fargo	Toomey, G. W.	Devils Lake	Westmoreland, M. G.	Grand Forks
Skarshaug, H. J.	Fargo	Tronnes, N.	Fargo	Weston, D. T.	Mandan
Skelsey, Albert W.	Fargo	Urenn, B. M.	Fargo	Weyrens, P. J.	Hebron
Skovholt, H. T.	Williston	Vance, R. W.	Northwood	Wheeler, H. A.	Mandan
Smith, C.	Devils Lake	Van de Erve, H.	Carrington	Wheelon, F. E.	Minot
Smith, C. C.	Mandan	Van Houten, J.	Valley City	Whittemore, A. A.	Napoleon
Smith, J. A.	Noonan	Verrett, B. D.	Rolla	Wicks, F. L.	Valley City
Smith, LeRoy G.	Mandan	Vigeland, J. G.	Brinsmade	Widmeyer, J. P.	Ro'lo
Smith, O. M.	Killdeer	Vinje, R.	Bismarck	Williams, Maysil	Bismarck
Sorenson, A. R.	Minot	Vinje, S.	Hillsboro	Williams, M. F.	Linton
Sorkness, J.	Jamestown	Vonnegut, F. F.	Hague	Williamson, G. M.	Grand Forks
Spear, A. E.	Dickinson	Wagar, W. D.	Michigan	Winn, W. R.	Fargo
Spielman, G. H.	Mandan	Waldren, G. R.	Cavalier	Witherstine, W. H.	Grand Forks
Stackhouse, C. E.	Bismarck	Waldren, H. M., Jr.	Drayton	Wolfe, F. E.	Oakes
Stransky, Theodore	Mandan	Waldren, H. M., Sr.	Drayton	Wood, W. W.	Jamestown
Stafne, W. A.	Fargo	Waldschmidt, R. H.	Bismarck	Woodward, F. O.	Jamestown
Stickelberger, J. S.	Oberon	Wall, W. W.	Minot	Woutat, P. H.	Grand Forks
Stolinsky, A.	Lisbon	Watson, E. M.	Fargo	Wright, W. A.	Williston
Strauss, F. B.	Bismarck	Weed, F. E.	Park River	Yeomans, T. N.	Minot
Swanson, J. C.	Fargo	Weeks, S. A.	Ambrose	Youngs, N. A.	Grand Forks
Tainter, R.	Fargo	Weible, E. B.	Abercrombie	Zimmerman, S. A.	Valley City
Thompson, A. M.	Wahpeton				

** Honorary

The Physiology of Hypertension*

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MY OBJECT in this paper is to review the fundamental physiologic points in the maintenance of normal blood pressure and the recent chapter which is being written regarding experimental hypertension with its relationship to essential hypertension.

Blood pressure may be defined as the lateral pressure exerted on the walls of vessels by the contained blood; thus we have arterial, capillary and venous pressure. Arterial blood pressure may be sub-divided into systolic, diastolic and pulse pressure, which three components normally bear approximately a 3-2-1 relationship to one another. All too often only systolic pressure is stated in referring to blood pressure, but diastolic is important also, for it is an index of the peripheral resistance.

Arterial blood pressure varies as the product of the cardiac output and the peripheral resistance. To a minor degree, it also depends on the elasticity of the large arteries, the blood volume and the blood viscosity. The cardiac output depends on the venous return, the force and the rate of the heart. Other factors remaining unaltered, an increase in cardiac output raises, and a fall in output lowers the blood pressure. The peripheral resistance is found chiefly in the tonically contracted arterioles (especially those of the splanchnic area and the skin), and to a less extent in the capillaries. The frictional resistance encountered by fluid which is passing through narrow tubes (*i. e.*, blood through the small arteries and arterioles), depends on its viscosity, the

size of the tube and the velocity flow. Normally the most important factor is the size of the arterioles.

These arterioles are under the control of a functional center, located in the floor of the fourth ventricle, the vasomotor center. This center is continually sending out, by way of the vaso-constrictor fibers of the autonomic nervous system, varying numbers of excitatory impulses per unit time, to the arterioles to maintain their normal degree of tone. The frequency of these impulses is modified by factors which influence the vasomotor center. Thus asphyxia, or the injection of histamine, increases the discharge. Other factors which influence the vasomotor center are: the higher centers, CO₂ tension and oxygen lack.

The Sinus and Aortic Nerves

These are the afferent nerves principally responsible for stabilizing the blood pressure and preventing it from varying very much. The afferent nerves from the carotid sinuses and the aortic arch normally carry up a constant stream of impulses which exert a tonic inhibitory influence on the vasomotor center. Section of either pair of nerves raises the blood pressure (more especially if the other pair has previously been cut). A rise of internal pressure in the carotid sinuses reflexly produces vasodilation.

Occlusion of the carotid arteries lowers the pressure in the sinuses and so reflexly raises the blood pressure. Acute complete cerebral anemia, from occlusion of the carotids and vertebrals, may produce a huge rise of blood pressure, partly reflexly from the decreased pres-

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sure in the sinuses and partly directly because of CO₂ accumulation and lack of oxygen in the brain.

The aortic nerves from the arch of the aorta function in exactly the same way as the sinus nerves and in a complementary manner.

In aortic regurgitation, the left ventricle is hypertrophied, the output of the heart per stroke is large, and the systolic pressure abnormally high. This sets up an exaggerated depressor sino-aortic reflex at the height of systole, and great arteriolar relaxation; the pressure in the arteries consequently falls rapidly toward the end of systole. The reflex is mainly responsible for the collapse of the pulse (*i. e.*, huge pulse pressure) chiefly due to a low diastolic pressure.

In regard to the relation of the adrenal medulla to blood pressure, two facts are worth mentioning: there is, or may be, a constant secretion of adrenalin which may help to maintain arteriolar tone and blood pressure at rest; adrenalin secretion is reflexly modified (via the sinus and aortic nerves) according to the level of the blood pressure, *i. e.*, a fall of blood pressure stimulates, and a rise of blood pressure depresses adrenalin secretion. These two sensitive areas also reflexly affect heart rate and thus on some occasions may affect cardiac output and thereby blood pressure in another way.

Control of Normal Blood Pressure

These are the salient facts in regard to the control of normal blood pressure. In the normal resting body, blood pressure is steadily maintained within comparatively narrow limits. Other things being equal, the blood flow through the brain will vary directly with the blood pressure. A pressure which is much below normal is unable to drive an adequate amount of blood to the brain against the force of gravity. If the blood pressure is raised excessively, it serves no useful purpose and imposes an additional burden on the heart. The desired constancy of the blood pressure is attained mainly reflexly by the buffer nerves, *i. e.*, the aortic and sinus nerves, principally by means of the variable inhibitory influence which they exert on the cardiac and vasomotor centers and on the adrenalin secretion. A rise of blood pressure at rest increases their inhibitory action; a fall lessens it, and may also bring into action pressor fibers which are believed to arise from these areas. In exercise the blood pressure rises, in spite of the sino-aortic nerves, mainly due to increased cardiac output.

Hypertension

Hypertension has been classified in various ways; I shall attempt to consider it from the physiologic view of: disturbances in cardiac output, vascular changes and disorganization of cardiovascular reflexes. The volume or viscosity of blood may also be factors.

Patients with polycythemic hypervolemia generally show no increase in blood pressure, cardiac hypertrophy or cardiac output, according to Grollman.¹ There seems to be no question, however, but that a continued hypervolemia such as obtained in heavy beer drinkers, leads successively to diastolic distention, increased cardiac output, hypertrophy and hypertension. Incidentally, such

observations indicate that indiscriminate forcing of liquids in patients inclined to have high pressures may not be an entirely harmless procedure.

Though it has been a controversial point for some time, a recent study with improved methods by Gladstone² has shown that cardiac output in hypertension is normal or below in most all cases.

Only one of the fundamental factors remains to be considered, namely, peripheral resistance or the size of the small arteries and arterioles. This factor is generally recognized as being the immediate one at fault in hypertension, whether it be "essential" (a term coined by Frank in 1911, to cover hypertension that was judged to be non-renal) or the renal form, *i. e.*, secondary to nephritis. Allbutt designated the supposed non-renal forms as "hyperpiesis." The concept that the kidney is responsible for most of the clinical instances of hypertension was at one time widely held. With the more general use of the sphygmomanometer and following the development of methods of estimation of renal function, it became clear that, while in patients with glomerular nephritis the increase in blood pressure is clearly secondary to renal diseases, the more common types of hypertension are frequently encountered in persons who display only minimal, if any, evidence of functional impairment of the kidneys and who exhibit no gross anatomical abnormalities of these organs at autopsy. Thus the concept of the "essential" type developed.

The problem since that time has been, to find the cause for increased tonicity of the arterioles, which increases the peripheral resistance and thus the blood pressure. A decrease or loss of sensitivity of the buffer mechanism (carotid sinus and aortic area) has been blamed. Green and DeGroat,³ as well as others, have denervated these areas in experimental animals and though this procedure will produce hypertension, it is not persistent. It will return to normal within a few weeks as a rule. The normal function of the buffer mechanism is well brought out in these experiments, however, in that animals with this mechanism removed present a most labile blood pressure. The slightest stimulus may cause it to climb well within the hypertensive range.

Stimulation of adrenalin secretion has also been postulated. There have been several recent reports of cases of paroxysmal, and later continuous hypertension in which paragangliomas of the adrenal medulla have been shown to be the offending etiologic agent, the removal of which leads to recovery. In one case crystalline adrenalin was recovered from the tumor.

In 1934, Goldblatt,⁴ of Western Reserve University, reopened the question regarding the possibility of kidney involvement in "essential" hypertension. He, as well as several other groups now, have by experimental interference with the renal blood supply produced persistent hypertension without evidence of significant change in renal function. Goldblatt's method, putting it briefly, consists of partially occluding the renal arteries by placing on them, by a retroperitoneal approach, small silver clamps. Collins,⁵ of the University of Minnesota, has partially occluded them by a different technic and others

have used various modifications of these methods. Goldblatt⁶ has also produced this experimental hypertension in monkeys. He has some animals which have displayed this high level of pressure for five years. Since these animals present a symptom-complex which resembles that of essential hypertension in man, it appears that the whole subject of the relationship between elevated blood pressure on the one hand, and renal arterial disease on the other, has been opened for re-investigation.

Though Goldblatt has not published the fact that he is carrying on any experimentation on these animals with the long-standing hypertension, I presume that he is making eye-ground examinations and perhaps biopsies for arteriolar studies to shed some light on the long debated question as to whether arterio- and arteriolar sclerosis is the cause or result of hypertension.

Moritz and Oldt⁷ of the department of Pathology, also of Western Reserve, have recently made an extensive study of the arteriolar changes.

They found, "The objective examination of arterioles in all parts of the body of 100 control cases and 100 cases of chronic hypertension, disclosed only one situation in which the presence of arteriolar sclerosis was almost invariably associated with hypertension and where the absence of arteriolar sclerosis almost invariably betokened an absence of high blood pressure. This was in the kidneys. Renal arteriolar sclerosis was present in 109 of the 200 cases studied, and 97 of these 109 proved to be cases of chronic hypertension. No comparable correlation could be found in any other organ or tissue.

"It was felt that these facts, together with the information gained from a study of the histological characteristics of arteriolar disease in hypertensive and non-hypertensive individuals, supported the conclusion that renal arteriolar sclerosis is the most common cause of chronic hypertension. This conclusion is in accord with the recent demonstration by Goldblatt that chronic hypertension is regularly produced in dogs and monkeys by reducing the blood flow through the kidneys (renal ischemia). The effect of the renal arteriolar sclerosis in human hypertension appears to be the functional analogue of the renal arterial clamp in experimental hypertension. In both instances, hypertension appears to be produced by reduction in renal bloodflow which does not necessarily lead to a sufficient degree of ischemia to impair renal function measurably.

"It is concluded that the only significant site of arteriolar sclerosis so far as the causation of hypertension is concerned, is the kidney."

Levy, Light and Blalock⁸ have measured the blood flow and oxygen consumption before and following the production of hypertension by the Goldblatt method and find them both reduced by the procedure.

What is the mechanism of the production of this experimental type of hypertension? There are two possibilities: *first*, a humoral mechanism, *i. e.*, the kidney under these ischemic conditions elaborates a pressor substance, and *second*, a neurogenic mechanism.

Collins⁵ was one of the first to test the second possibility. He completely denervated the kidney and was still able to produce an elevation of pressure by ischemia.

Child and Glenn,⁹ feeling that some few nerve fibers may still have been left intact, have secured complete denervation by transplantation of the kidney to the pelvis, reestablishing the blood supply by means of the femoral vessels. When this kidney was made ischemic and the other one removed, hypertension developed.

The evidence thus points to the humoral mechanism. Page,¹⁰ in 1936, found a pressor substance in blood of experimental hypertensive animals but he also found it in non-hypertensives in like amounts. Harrison *et al*¹¹ have obtained pressor effects from saline extracts of dog kidneys when these extracts were given to anesthetized rats. Extracts from normal dogs produced a significant rise in blood pressure, but extracts from kidneys rendered ischemic produces a greater rise. When one kidney only was rendered ischemic, it gave a greater pressor response than did the normal kidney from the other side.

From the findings by various investigators, it appears that it is a pressor substance, *i. e.*, a humoral mechanism, which is the basis of the experimental hypertension. Does it work directly on the vessels or by stimulation of the vasomotor center, and thus by way of the vaso-pressor fibers?

Goldblatt, Gross and Hanzal¹² have found that excision of the lower four dorsal sympathetic ganglions and the thoracic portion of the splanchnic nerves on both sides does not prevent, cure or permanently lower hypertension produced by renal ischemia. Alpert *et al*,¹³ have found that total sympathectomy at best only partially obliterates the experimental elevation produced, and that after total sympathectomy a blood pressure rise can be produced by renal ischemia. Thus, it seems to be well established that hypertension produced by renal ischemia is of humoral origin and independent of renal innervation. The pressor substance appears to arise within the ischemic kidney and to act directly on the arteriolar walls.

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The Value of the Individual Health Record in Hygiene Teaching

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HEALTH EDUCATION is quite generally regarded as one of the most important functions of a well organized student health service. In many universities and colleges the various health courses offered to students are taught by members of the health service staff. Such a plan provides the opportunity for a more effective health program and one which is more in keeping with the needs and capacity of the student at the college level. Although much may be accomplished in health education through formal classroom presentation of properly selected material, we must not overlook the fact that the health problems of the college group are largely individual problems. It would seem highly desirable, therefore, to supplement the health teaching by making provision for individual health conferences wherever such a plan is feasible. The value of this procedure has been clearly demonstrated since its recent inception at the University of Pennsylvania.

The present study was undertaken in the hope that certain significant information might be brought to light which might assist us in improving the program now in effect. Our approach to the subject has been conducted along three rather separate and distinct lines.

1. A survey of approximately 400 men and women students now taking the required hygiene course, to determine as accurately as possible, the content of health courses being given in this area in junior and senior high schools.
2. A study of the histories and physical examination records of approximately 1100 entering men students.
3. Personal interviews, at weekly intervals, with a group of first year students in an attempt to learn something of their health interests, personal problems, *etc.*, and to use the information thus obtained as an aid in planning and, if indicated, in revising our health teaching.

We felt that a survey of this kind should give us a rather clear picture of the group we have to deal with. What has been their preparation in the field of health before coming to the university? What will the individual health record reveal concerning health habits and health practices, physical defects, *etc.*, which may be of assistance to us in planning a more practical and more individualized program of health education? And finally, what does the student want to know about health? What are his personal problems? These are some of the questions that we had in mind before beginning the survey and we believe they have been answered at least in part.

In order to learn just what material had been presented in high school to these first year students enrolled

in the required hygiene course, we prepared a printed form listing twenty-nine subjects pertaining to personal and community health. The student was asked to check those which had actually been presented and discussed in his previous health courses. We personally visited each of the six hygiene sections and explained the nature and purpose of the study, emphasizing the need for careful and thoughtful replies to all questions appearing on the questionnaire in order to make the results as accurate and trustworthy as possible. The tabulation below shows the percentage of students who had received instruction in each of the subjects listed.

TABLE I.
Survey of First Year Students Enrolled in Required Hygiene Course at the University of Pennsylvania

Material Presented in Health Courses in Junior and Senior High School.	Percent of Students Having Received Instruction in Health Subjects Listed.		
	Men	Women	Total
Body Structure	78.5	81.5	79.5
Growth and Development	59.0	63.6	60.5
Normal Body Function or Physiology of:			
Digestion	77.3	82.3	78.9
Heart and Circulation	80.3	85.3	81.9
Respiration	80.7	84.6	82.0
Nutrition	79.2	83.8	80.7
Composition of Foods	61.9	68.4	64.0
Food Requirements of the Body	70.9	75.3	72.4
Vitamins	73.2	81.5	75.9
Caloric Values	68.3	66.1	67.5
Protective Foods	45.8	56.9	49.4
Milk as a Food	67.6	65.4	64.6
Causes of Overweight and Underweight	52.3	51.9	52.1
Eating Habits	73.6	72.8	73.1
Bacteria	62.2	55.8	60.0
Infection and Immunity	62.7	62.0	62.5
Communicable Diseases	68.0	66.2	67.6
Carriers	62.3	52.7	59.1
Vaccines and Antitoxins	61.9	54.2	59.4
Tuberculosis	61.6	63.5	62.2
Veneral Diseases	36.8	25.5	33.1
Sex Hygiene	37.6	33.3	36.3
Sanitation of Water and Milk Supplies	75.3	62.0	70.9
Pasteurization of Milk	74.4	62.8	70.5
Sewage Disposal	65.1	40.3	56.9
Sunlight	79.5	71.3	76.8
Air and Ventilation	81.7	78.3	80.6
Heredity and Eugenics	27.6	30.2	26.1
Mental Hygiene	12.9	13.4	13.1
Number of Men	266		
Number of Women	130		
Total			396

In viewing this table it will be noted that the physiology of respiration and circulation have been presented more frequently than any other subject matter. These are closely followed by nutrition, air and ventilation, body structure and the physiology of digestion, in the order named. As for those phases of health dealt with most infrequently, we find the very important subject of mental hygiene being the one most neglected. To only 13.1 per cent of this group had there been presented anything dealing with emotional and mental health. I believe this to be largely due to the fact that the majority of teachers have not had adequate training and preparation in this field. They are, therefore, not quali-

† From the Student Health Service, University of Pennsylvania.

fied to discuss intelligently even the most elementary phases of this subject, which is of such importance to the adolescent group. Other phases of health education which have been covered by a relatively small percentage of students in their high school courses are heredity and eugenics, venereal diseases, and sex hygiene. Infection and immunity and tuberculosis occupy intermediate positions in the list, each having been taught to 62 per cent of the students in this group.

In the questionnaire employed in securing the above information we asked for comments and criticism of the students' high school health courses. We asked particularly that they designate the material which they considered to be of most interest, as well as of most practical value, and to indicate those phases of health teaching which they felt might have received undue emphasis in consideration of their importance and practicability. The comment thus elicited was for the most part definitely constructive and revealed much in the way of criticism and suggestions which, we believe, may well be used to advantage. Students are in quite general agreement that the teaching of biology and other science courses is usually much more expertly handled than the teaching of hygiene. Some of the more frequent criticisms of the health courses may be summarized as follows: too much time devoted to anatomic detail, structure and function; students feel that such material is of little practical value in the form in which it is usually presented. Instructors do not encourage questions and discussions; are frequently unable to answer questions relating to ordinary health problems; purposely avoid anything bordering on the field of sex hygiene; present only the material outlined in the text, lacking in originality and interest and denoting in the student's opinion, inadequate training and preparation in the field of health.

To supplement the personal comment and criticism, in an attempt to better evaluate the quality of health teaching in high schools, we asked the students to grade their courses as A—excellent, B—fair, and C—poor. They were asked to be honest and fair in their appraisals and to compare, as far as possible, the teaching of their health courses including organization, materials presented, manner of presentation, *etc.*, with that of other subjects. We know that in many high schools the teaching of health is assigned to members of the teaching staff who have had very little training in this particular field. As a consequence the job is often poorly done and the student's interest in health matters remains at low ebb. We hoped that by this system of grading we might be able to more accurately judge the type of preparation these students had had before coming to us. As will be seen by the following tabulation, approximately 25 per cent of the students rated their high school health courses as "excellent", and just about the same number rated them as "poor". The remaining fifty per cent considered them to be "fair".

In an attempt to get some expression of the student's interest in the field of health, we submitted the following question, "Do you consider the teaching of health to

college students important enough to justify a requirement whereby all new students shall take a two-semester credit course for which full credit is given?"

TABLE II.

	Men	Women
Students grading high school health courses "A".....	25.5%	23.1%
Students grading high school health courses "B".....	49.8%	53.8%
Students grading high school health courses "C".....	24.7%	23.1%

We assumed that voting in favor of an additional semester hour of hygiene teaching might be taken as fairly good evidence that the student had a worth-while interest in the subject. The replies show that 83.7 per cent of men students and 97.5 per cent of women students favored additional health teaching. We have observed also in our personal interviews that women students seem to be more keenly interested in practically all phases of health, a situation which was not anticipated.

Table III summarizes the various health courses taken by members of this class in junior and senior high school. It will be seen that almost ten per cent of men students had neither hygiene nor science courses of any kind, whereas over fifty per cent of the entire group had taken courses in both hygiene and biology. This indicates, as one might expect, a rather striking lack of uniformity in the health teaching programs of the various states from which our students come. In view of the relatively high percentage of students who have had very little in the way of health education in secondary schools, the low average rating reported by Dr. Forsythe of Michigan as a result of using his health knowledge test in freshman groups is not surprising.

TABLE III.

	Men	Women
Students having had no course in hygiene or biology.....	9.1%	3.9%
Students having had biology, but no hygiene course.....	19.1%	7.8%
Students having had biology and one hygiene course.....	32.7%	35.6%
Students having had biology and two hygiene courses.....	22.2%	17.1%
Students having had no biology.....	26.0%	39.5%

The second part of this investigation deals with the histories and physical examination records of approximately 1100 entering men students. All of the information obtained in this manner is tabulated below. Although much of this material has no direct bearing on the teaching of hygiene and merits no comment, it may be of some interest.

TABLE IV.

Information Obtained by Reviewing the Histories of Approximately 1,100 First Year Men

1. Size of home community:	
Students from communities of 5,000 or more.....	80.2%
Students from communities of less than 5,000.....	19.8%
2. Size of family:	
Students from families of 1 child.....	16.8%
Students from families of 2 children.....	30.8%
Students from families of 3 children.....	24.8%
Students from families of 4 children.....	14.4%
Students from families of 5 or more children.....	13.2%
Average number of children per family.....	2.9
3. History of past illness:	
Students having had measles.....	93.0%
Students having had chicken-pox.....	62.6%
Students having had whooping-cough.....	59.14%
Students having had scarlet fever.....	21.83%
Students having had pneumonia.....	12.64%
Students having had inflammatory rheumatism.....	3.09%
4. Do you consider yourself to be in good health?	
Students answering Yes.....	92.2%

5. Do you smoke?	
Students answering Yes	46.8%
6. Have you ever previously had a complete physical examination comparable to the one you received here today?	
Students answering Yes	54.0%
Of 589 students replying Yes—	
No. examined by private physician	143 24.3%
No. examined by school or team physician, insurance examiner, or others	446 75.7%
Of entire group of 1,090 students, therefore, 143 or 13.1% had been given a complete physical examination by the family physician.	
7. Visits to family physician before coming to the University:	
Students having consulted private physician within 1 year	74.3%
Students having consulted private physician within 1-2 years	12.1%
Students having consulted private physician within 2-3 years	5.0%
Students having consulted private physician within 3-4 years	1.7%
Students having consulted private physician within 4-5 years	1.0%
Students having consulted private physician more than 5 years ago	5.7%
Average number of visits per year by those students having consulted their private physician within 1 year	3.3
8. Visits to Student Health Service during their first school year (9 months) on the campus, of 500 students selected at random from this same entering group:	
Total visits to Student Health Service	2,611
Average number of visits per student	5.2
Average number of voluntary visits per student for advice or treatment, exclusive of required physical examinations, etc.	4.6
9. Mental Hygiene:	
Students giving history of nervous breakdown	27%
Students giving history of nervous or mental trouble in mother or father	7.3%
Student histories regarded as significant by the psychiatrist and called in for interview	64.9%
Student histories indicating a need for prompt psychiatric help	16.4%
(Histories of 1,137 men and 482 women reviewed by psychiatrist).	

The questions appearing in paragraphs 6 and 7 do not appear on the history and physical examination record form that we use, but were asked of all men students at the completion of the entrance physical examination. We wanted to know something of the health practices of this group with reference to visits to the family physician for health examinations and for advice and treatment. As shown in paragraph 6, fifty-four per cent of 1,090 students stated that they had previously had physical examinations quite comparable in completeness and detail to the one required at the time of entrance to our university. But only 143 of the group or 13.1 per cent, had been given such an examination by the family physician.

The next question asked was "When did you last consult a private physician?"

Paragraph 7 summarizes the replies. We were rather surprised to find, after questioning the first two or three hundred students, that such a high percentage had seen the family doctor only a few weeks or months prior to coming to the university. Further questioning of this particular group revealed the fact that the bulletin sent out by the university to all prospective students carried the information that a certificate of successful vaccination was required at the time of registration. Students who had visited the family physician for the purpose of securing such a certificate constitute, therefore, a rather

generous portion of the group shown to have consulted a physician within one year. The Health Service records of 500 students in this entering class of 1936 have been reviewed to determine the frequency with which these students came to the Health Service for advice or treatment during their first year on the campus, *i. e.*, over a nine-months period. We find that a total of 2,611 visits or 5.2 visits per student were made during the freshman year. We now plan to check the records of the same 500 men at the end of each school year to determine whether or not they use the Health Service facilities more and more with each succeeding year on the campus. The results should indicate, in some measure at least, the value of the Health Service as a medium for health education. Certainly the Health Service with a carefully-selected staff has the opportunity to carry on a most constructive health program, one which should serve as a most valuable adjunct to the health teaching program.

In the field of mental hygiene we now attempt to interview, in the psychiatric clinic, all students whose histories suggest even a minor problem. All histories are reviewed by the psychiatrist the same day that the physical examination is given. During the past school year this screening process resulted in 64.9 per cent of 1,619 students being called in for interviews with the psychiatrist. Many students, of course, at the time of the personal interview, were found to present no real problem. However, the number with really significant problems uncovered by this process, approximately 16 per cent, is convincing evidence of the value of such a procedure.

TABLE V.
Summary of Information Taken From Physical Examination Records

1. Nutritional Status of 1,082 First Year Men:		
Per Cent of Standard Weight	Incidence	Per Cent
93 to 107	572	52.9
108 to 112	121	11.2
113 to 117	76	7.0
118 and above	96	8.8
88 to 92	139	12.9
83 to 87	52	4.8
82 and below	26	2.4
Two hundred and fifty students, or 23.1 per cent of the entire group are 13% or more above or below standard.		
2. Vision:		
Less than 20/30 in one or both eyes		30.2%
Have glasses ever been prescribed for you?		
Yes		44.0%
No		56.0%
Of 481 students having had previous refractions:		
Lenses prescribed by oculist		66.1%
Lenses prescribed by optometrist		31.8%
Lenses prescribed by oculist and optometrist		2.1%
3. Tonsillectomies:		
Students having had tonsillectomy		72.5%
Students having had tonsillectomy poorly done, in opinion of examining otolaryngologist		7.5%
4. Nasal Obstruction:		
Students with Degree 1—mild		7.7%
Students with Degree 2 and 3—moderate and severe		7.5%
5. Heart Murmurs:		
Murmur present in 138 of the 1,098 examined		12.5%
Apical murmur only in 20 cases		14.5%
Basal murmur only in 66 cases		47.8%
Apical and basal murmurs in 52 cases		37.7%
6. Abdominal Scars—Operative:		
Students having appendectomy scars		11.2%
Students having herniotomy scars		1.6%
7. Hernia present:		
11 cases in 1,098 students examined		1.0%

8. Tuberculosis Record:

Positive reactors, using 0.01 mg. Old Tuberculin intracutaneously (Mantoux) as first dose, and 1.0 mg. Old Tuberculin as second dose	48.0%
Number of cases of pulmonary tuberculosis among 303 positive reactors who received chest X-rays	1 or .33%

With reference to physical defects, I believe the material presented in the eight sub-headings of Table V may give us some hint as to part of the content, at least, of our hygiene course. It will be noted that almost 16 per cent of our entering male students are 13 per cent or more above so-called standard weight, while slightly more than 7 per cent of the group are 13 per cent or more below standard. The students making up these two groups number 250, or 23.1 per cent of the entire class. It is obvious that in dealing with nutritional problems in the classroom as a part of the hygiene instruction, little will be accomplished by way of improving the nutritional status of these individuals. Each presents his own personal and individual problems. Experience in our nutrition clinic has shown that careful study and closely supervised management fail to produce the desired results in a fairly high percentage of these markedly overweight and underweight persons. Here, I believe, is one field in which our efforts toward health education will be much more effective if we provide for individual conferences and discussions as a supplement to the formal hygiene teaching.

Sub-heading 5 of Table V reveals the fact that 12.5 per cent of the men in this entering class were found to have heart murmurs. During the past five years we have provided complete cardiac study including a detailed history, electrocardiogram, orthodiagram and careful clinical investigation, as a routine procedure for all students presenting such murmurs. As a result of this study we have found that approximately 16 to 18 per cent of all students with cardiac murmurs have been shown to have definite organic lesions. All borderline cases are re-examined by the cardiologist from time to time, some as often as every three months.

With reference to tuberculosis as a health problem, we realize, of course, that we are dealing with that particular age group which is most vulnerable to this particular disease. The real danger zone for the development of the re-infection or adult type of tuberculosis is between the ages of sixteen and twenty-six years. It is our practice to routinely X-ray the chests of approximately 25 per cent of our student body each year. The entering freshman class gives the lowest incidence of disease and medical students, who are X-rayed annually, the highest.

The third part of the study was given over to personal interviews with a group of sixty-four first year students. The total time spent with each student, seen at weekly intervals, was approximately five hours. At the time of the first interview we explained that the student was to feel perfectly free to suggest ways and means by which

we might more effectively meet the health needs of the student through the teaching of hygiene. We questioned them concerning their individual health interests and their personal health problems. These we discussed with them at length, permitting them to ask any questions that they desired. This procedure brought to light a rather clearly defined picture of the attitudes, interests, problems and perplexities of a representative cross-section of our freshman class. Some of the more pertinent information obtained through these interviews may be summarized as follows:

1. Of 64 students interviewed, only 15.6 per cent have ever consulted a private physician for anything other than treatment of acute illness.

2. There were 40.6 per cent of the group who have sought advice from persons other than physicians with reference to personal problems such as worries, anxieties, information regarding sex matters, etc.

3. There were 68.7 per cent who state that they have had problems during the past four years where they feel they could have benefited materially had they known to whom they might go for assistance.

4. The 64 students were practically unanimous in the opinion that personal interviews for the discussion of their personal problems as well as their health problems, should be a regular part of the hygiene course.

5. Nearly all students have signified a preference for small discussion groups rather than large classes in the required hygiene course.

Summary

The vast majority of our university freshmen have manifested a commendable interest in health as measured by the various procedures we have employed. We are convinced that a desirable method for broadening the scope of health education is through a better coördination of the programs of health teaching and health service. Individual health conferences on a required and voluntary basis may be used with advantage to supplement the required courses in hygiene. By use of this method, the health counsellor occupies a most strategic position in the field of health education. The need for this particular type of constructive health service is emphasized by the results of this study, showing that less than sixteen per cent of students we interviewed had consulted private physicians concerning problems other than acute illness. The health practices of this select group of young adults fall far short of what we may today consider as ideal. Through careful planning of the college health program it is possible to bring the student up to graduation much better prepared to meet the varied problems in personal and community health.

The JOURNAL LANCET

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American Student Health Association

North Dakota State Medical Association
South Dakota State Medical Association
Medical Association of Montana

The Sioux Valley Medical Association
Great Northern Railway Surgeons' Assn

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NATIONAL CONFERENCE OF SOCIAL WORKERS

The National Conference of Social Workers was held in Seattle June 26 to July 2. The following quotation from an Eastern newspaper furnishes interesting and provocative data:

"The social workers of the nation gathered in convention during the last week, were as much at a loss for an answer to this problem of medical care as were the doctors of the A. M. A. in San Francisco two weeks ago. While some individuals believed that eventually a program of tax-paid medicine would be evolved to take care of the masses of population, most of the social workers left with the feeling that an adequate 'medical-care' program would be a long time emerging."

Mr. Biemiller of Milwaukee, Wisconsin, criticized what he termed the doctors' attitude; he claimed that they "have taken an extremely short-sighted view of this problem; that they insist their own private charity and sliding scale of fees are entirely adequate to meet the medical needs of the wage-earning group; that the doctors claim that it is not always because of low incomes that the patients do not come in contact with the medical profession, but that it is often due to ignorance and stubbornness." Biemiller affirmed that physicians are a century behind in the matter of medical economics. He suggested the establishment of a contract service similar to the one effective in Milwaukee; one that "meets the needs of a family with a small but steady income (\$1500 to \$3,000); a contract which gives medical

service, operations and specialists for a flat rate of \$1.00 a month per person or \$3.00 per month per family regardless of the size of the family."

Dr. Leland spoke in behalf of the A. M. A. and mentioned its plan for a nation-wide survey.

Helen Hall, of the Henry Street Settlement, New York City, was not at all enthusiastic over Dr. Leland's talk and the mention of the proposed survey; she expressed wonder that (apparently) physicians did not seem willing to coöperate with the thousands of social workers in the national and local field, especially with those who were advocating health insurance.

Judging from the oft-repeated assertions of those in governmental careers concerning medical care and relief in general, and also from the social agencies lined up with the same system, it seems to us that all of the proponents for governmental administration in these affairs are now well agreed upon at least two points.

(1) That the present political set-up, together with the serious financial and economic depression plus the problem of much unemployment for the laboring and the clerical classes, is to continue for some years.

(2) That despite the doctors' emphatic statements that hitherto they have handled medical care in a rather satisfactory manner for themselves and for the public, and are willing to continue that method, there is now such an enormous number of unemployed persons requiring actual subsistence and medical care, that some uniform plan must be adopted by the authorities leading

to the care of these people. This plan must be had at the least possible expense to the authorities.

Some of the arguments of the social-service proponents are varied and misleading. A good example is the suggestion they have made that a person earning \$3,000 per year should be freely given a contract rate for medical care of all types, for \$36.00 per year for the whole family, regardless of size. A few years ago, almost any fellow earning even half that salary would have been amazed and humiliated at such a suggestion.

A. W. S.

TRANSACTIONS OF THE NORTH DAKOTA STATE MEDICAL ASSOCIATION MEETING

All members of our state association should carefully read the published proceedings of the annual meeting. There is an unfounded theory and a dubious belief that without exception all delegates to our state annual sessions methodically report all details at the next meeting of their local societies, and also that all members read thoroughly all numbers of their medical journal.

I would like to point out a few important facts appearing in the transactions which are published in this issue.

The reports of the ten councillors concerns the thirteen county and district organizations. Cass, for instance, the largest populated county, gives the longest report, yet clearly shows that it is far from satisfied with its present problems. Other societies strike a more cheerful note and are apparently more at ease in their medical Zion. A study of these papers, of the various standing committees' reports, and of the different discussions clearly proves how changed are these later years from former decades, when to medical men the modern topic of economics and suggested regimentation by governmental and social agencies was not the physicians' limelight nor a desirable or necessary subject for public airing and discussion. But now as one reads medical and non-medical material, or listens to the voices of the social uplifters onto high heaven, he must acknowledge these conditions changed and for the worst.

The paper read by the director of the North Dakota Public Welfare Administration, Mr. Willson of Bismarck (to be printed in the next issue of *THE JOURNAL*—

LANCET), indicated that there were 70,000 families on relief in this state,—practically one-third of our population. Note his remarks regarding medical care and expense. Unless we have good crops this year, we shall probably continue in that serious situation.

Nor should our doctors pass by, unread, the kindly writings and appreciations set forth by Necrologist Grassick, respecting those physicians who have died during the year; he is so gracious that always he searches for and records only the better side of our fraternity.

In the transactions, reference is also made to the emphasis now being stressed upon all types of social service propagated in mass by governmental and social agencies; to mass movements against certain diseases; and to the animated but distorted barrage against the medical profession.

A. W. S.

INHERITANCE IMPORTANCE

We give, devise and bequeath to our children, property both real and personal; and in anticipation of death we provide for their education and after-care by insurance. There follows an appraisal and division of the estate among the heirs by probate adjudication according to our expressed desires. We leave albums of pictures taken at different ages of members of the family and sometimes a very short genealogy; but outside of these we leave them no accurate record of their physical inheritance.

It is startling to find how few persons know the ages and causes of death of their grandparents. There are many who have but a vague conception and apparently little interest in matters of this kind even when pertaining to their own parents. To the pathologist who is delving in post mortem findings, the thought that must often occur is how important it should be to every family to have a copy of the autopsy protocol of the ancestors. This is a far more important inheritance than shares of stock which may so easily be dissipated. Ancestral paintings over the fireplace may have a sentimental appeal, but to a physician it would seem more important for a member of the living generation to have pictures of his right and left coronaries together with a record of the stuff that he was made of.

A. E. H.

Book Notices

The Compleat Pediatrician, Practical, Diagnostic, Therapeutic and Preventive Pediatrics, by W. C. DAVISON, M.D.; second, completely rewritten edition; 250 pages; Durham, N. C.: Duke University Press: 1938. Price, \$3.75.

In this one-volume encyclopedia, you will find (1) one hundred and sixty-four signs and symptoms peculiar to childhood;

(2) a concise summary of the differential diagnosis of 329 diseases of children; (3) the grain separated from the chaff in pediatric treatment (drugs and prescriptions especially valuable); (4) two hundred and thirteen practical laboratory tests that have stood the test of time; (5) the best facts in the growth, development, and guidance of children, which every non-medical health worker as well as physician should know; and (6) excellent instruction for taking histories and making physical examinations.

If you want leisurely reading, do not buy this book, but if you want accurate, precise, practical, up-to-date pediatrics, be sure to get a copy and make a constant companion of it.

News Items

Dr. D. Howard Rolig of St. Paul, Minnesota, has purchased the practice of Dr. L. J. Hoyer of Howard Lake, Minnesota. Dr. Rolig was graduated from the University of Minnesota medical school in 1937. Dr. Hoyer is going to Chicago where he will take a special course in surgery.

Dr. Harry V. Gibson of Eau Claire, Wisconsin, has been chosen city-county health officer in Great Falls, Montana. The city-county board of health unanimously chose Dr. Gibson to fill the position vacated by Dr. F. L. Watkins who died last April. Dr. Gibson has been head of the Eau Claire county health unit in Wisconsin and has been active in public health work in Eau Claire county for the past 11 years serving as part time health officer there until January last year when he was appointed as director of the health unit. Previous to that time he had taught in the medical school of the University of Wisconsin and had been head of the state blood chemistry and Wassermann test laboratories.

Five pre-school age health clinics were held in Nelson county, North Dakota, in June. Complete physical examinations were given and defects pointed out to the parents. Instructions in feeding, care and training of children was a special feature.

Overcrowded conditions at the U. S. Veterans Hospital at Fargo, North Dakota, will be relieved by an allotment of \$191,000, a PWA grant which President Roosevelt has approved. The Fargo allotment is part of the total of \$13,368,200 provided for 22 veterans' hospital projects.

Dr. L. N. Casmev, formerly of Moorhead is now practicing in Crookston, Minnesota, his native city. Dr. Casmev was graduated from Northwestern University medical school in 1921. He had practiced in Moorhead the past six years; before coming to Moorhead he was in Halstad, Minnesota.

Dr. P. Rozendal, who practiced in Lake Preston, South Dakota, for the past seven years is now in Klamath Falls, Oregon, where he has accepted a position as public health officer.

Dr. J. H. Fjelde, Fargo, North Dakota, was elected chief of staff of the St. John's hospital, in that city, recently. Dr. A. Fortney was named vice-president, and Dr. O. A. Sedlak, secretary-treasurer. Trustees are Drs. W. H. Long, A. J. Clay and G. A. Larson.

Dr. E. H. Loenholdt who practiced in Hector, Minnesota for the past six years, left last month for the University Hospital, Minneapolis, where he has received an appointment to the resident staff. He intends to spend the next two years specializing in eye, ear, nose and throat work.

Dr. Fred Wittich of Minneapolis, Minnesota, addressed the Regional Allergists Association at Cincinnati, Ohio, on May 22nd. He spoke on "Grain Smut Allergy."

All officers of the South Dakota Hospital Association were reelected and Mitchell was chosen as the 1939 convention city, at the twelfth annual association conference held in Pierre, South Dakota.

The Central Association of Obstetricians and Gynecologists will hold their tenth annual meeting October 6, 7, 8 at the Radisson Hotel, Minneapolis, Minnesota. All physicians of the Northwest are invited to attend the meeting.

Dr. Phillip Sorenson, son of Dr. A. R. Sorenson, of Minot, North Dakota, recently joined the staff of the Northwest Clinic in Minot, as surgeon. He is a graduate of Johns Hopkins University School of Medicine and recently completed two years as resident surgeon at Minneapolis General Hospital.

Necrology

Dr. Richard H. Morgan, 57, formerly of Minneapolis, Minnesota, died in Detroit, Michigan, July 9, 1938. He was graduated from the University of Michigan medical school in 1908.

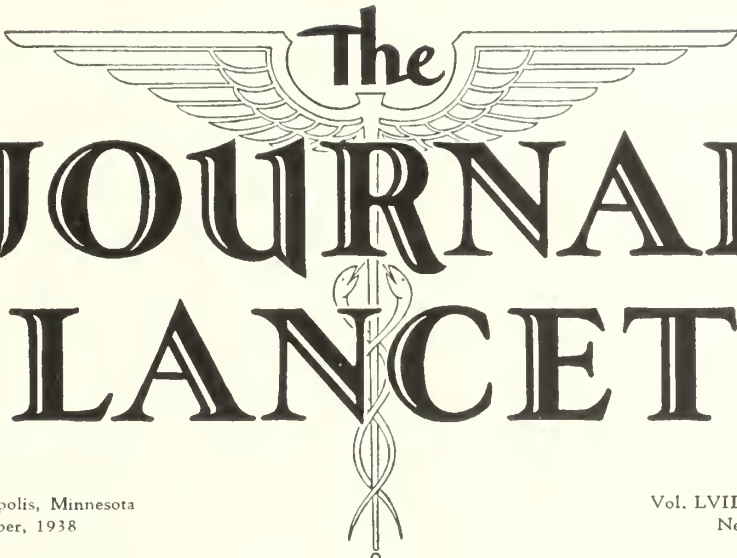
Dr. A. F. Groves, 84, a former resident of Brainerd, Minnesota, died June 22, 1938, at Daytona Beach, Florida, where he had resided for several years. Licensed in 1876, Dr. Groves practiced in North Dakota before coming to Minnesota.

Dr. Charles E. K. Vidal, 68, of Troy, Montana, died June 20, 1938. A retired physician and surgeon, Dr. Vidal had been superintendent of the Montana State Tuberculosis Sanitarium at Galen for many years. He retired from that position early in 1937.

Dr. Charles Fremont Dight, 80, Minneapolis, Minnesota, a leader in the eugenics movement and former faculty member at the University of Minnesota, died June 20, 1938. About fifteen years ago, Dr. Dight attracted considerable attention as Minneapolis' only tree dweller. He had a four room and porch dwelling on steel posts among the branches of oak trees on his property. The idea for such a dwelling developed while he was teaching medicine at the American University in Beirut, Syria, where many huts were built on stilts. A graduate of the University of Michigan medical school in 1879, Dr. Dight taught medicine for 26 years. In addition to his six years in Syria, he taught at the University of Michigan, Tulane University in New Orleans, Hamline University in St. Paul, Minnesota, and the University of Minnesota. He was a noted author and the first president of the Minnesota Eugenics society, a society for "promoting race betterment" incorporated in Minnesota in 1928.

Dr. W. P. Ross, 45, died at his home in Battle Lake, Minnesota, June 25, 1938. Dr. Ross, formerly superintendent of the Otter Tail County Sanitarium, left Fergus Falls, Minnesota, last November to become superintendent of the Battle Lake sanatorium.

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New Series

Diagnosis and Office Treatment of Rectal Diseases*

Walter A. Fansler, M.D., F.A.C.S.†

Minneapolis, Minnesota

SINCE the rectum may easily be visualized by use of the anoscope and the proctoscope, it might seem that symptomatology is not as essential in the diagnosis of rectal diseases, as it is in diseases of internal organs where visualization is not possible. However, when we consider that the rectum and anus are the outlet of the entire intestinal tract, and that symptoms seemingly due to rectal conditions may be from some more distant portion of the bowel, it then becomes apparent that such symptoms must be carefully evaluated. In the case of bleeding, bright red blood is usually considered to come from some point higher in the bowel. This is usually the case, but not infrequently severe bleeding at a point high in the intestinal tract, may also cause the rectum to be filled with bright red blood. On the other hand, blood coming from a rectal lesion may gradually back up into the colon and become clotted and black before it is expelled through the rectum.

Pain when low down, sharp in character and associated with bowel movement is frequently due to a lesion in the anal canal, or the lower part of the rectum. Pain which is constant in character and increasing in severity most often indicates pus under tension. Dull aching pain well inside the rectum suggests ulceration or malignancy. It must be recalled, however, that pain seemingly in the rectum may be referred from the prostate, the female organs, or other structures adjacent to the rectum. The discharge of pus or mucus from the rectum means some inflammatory condition. If the number of bowel movements are not increased and the amount of

secretion is small, the most common cause is a mild proctitis or colitis or a rectal sinus. It must not be forgotten, though, that the passage of a little mucus, blood-tinged or otherwise, is often the first sign of an early rectal malignancy. When the passage of mucus or pus occurs several times during the day, and is accompanied by urgency and tenesmus, it is likely that a more serious inflammatory condition is present, or that the patient is suffering from a well advanced rectal cancer.

An increasing constipation is sometimes suggestive of a colonic obstruction but it is not a symptom of rectal malignancy. In this day of the almost universal use of mineral oil for chronic constipation, more and more lesions are developing to the point of complete obstruction before the patient is aware that anything is seriously wrong. Extra rectal pressure such as is caused by an enlarged uterus or ovaries, may produce constipation. Perineal tears and fecal impaction may also be a cause. Diarrhea is a common symptom and its causes may be divided into dietary, organic, and functional. The organic group may be due to abnormalities in the organs discharging their secretions into the intestinal tract, or to lesions of the gastro-intestinal tract, itself. Reflex diarrhea from rectal lesions, usually inflammatory in character, is not unusual. Nervous instability often produces the so-called "nervous diarrhea," without any organic change. General disturbances such as anorexia, anemia, loss of weight and strength, when due to a rectal lesion, usually indicate some grave condition. It is possible, however, for a painful lesion, such as a fissure, to produce these symptoms through pain, loss of sleep, and the patient's refusal to eat because of the inevitable painful defecation.

* Presented at the South Dakota State Medical Association annual meeting, Huron, S. D., May 11, 1938.

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The first examination, we believe, should be made without any cleansing enemas or other rectal preparation having been given. The reason for this is that the discovery of blood or mucus in the rectum is often the only clue to some lesion higher in the bowel. Blood or mucus seen coming down from beyond the end of the proctoscope is most suggestive, and an enema washes away this evidence. If too much stool is present to visualize all portions of the rectum clearly, a plain water enema is indicated, after which the examination may be completed. Examination of the patient should be conducted in an orderly and careful manner. A definite routine will produce much better results than haphazard methods. The patient should first be placed in the Sims position with the buttocks retracted, and a careful external inspection then made under a good light, either natural or artificial. If no abnormalities are found, the next procedure should be a digital examination. This should always precede the insertion of any instrument. If the finger cannot be passed without difficulty, the passage of an anoscope is sure to cause severe pain and perhaps serious injury. If the attempt to pass the index finger causes too severe pain, the examination should be abandoned until anesthesia, either local or general, is available. It is impossible to complete an adequate examination where the patient cannot relax. If the finger can be successfully passed, the tip should be swept around the rectum to discover if any masses, areas of induration or other abnormalities are present. Next, the perianal and perirectal tissues should be palpated between the index finger and thumb (bidigital examination). In this way, any tender or hardened areas in the perianal tissues may be outlined.

The anal canal and lower inch of the rectum should now be inspected through the anoscope. Lesions in this region are usually quite evident, hemorrhoids, fissures, low-lying polyps, hypertrophied papillae inflamed and tender crypts, and anal and low-lying malignancies. For proctoscopic examination the patient should be placed in the knee-shoulder position, unless a special table for inverting the patient is available. In this position the intestines fall against the diaphragm and when the proctoscope is inserted, air will rush into the rectum ballooning it out so the entire interior of the organ is easily visualized. The moment the proctoscope has passed through the anal canal, the obturator should be withdrawn and the instrument further advanced under direct vision. The blind passage of a proctoscope may result in serious or fatal complications through rupture of the bowel. In case of a pneumatic proctoscope this complication can also result from over-inflation.

Upon a diagnosis being made, it must then be decided whether the condition is medical or surgical, and whether the patient can be cared for satisfactorily in the physician's office, or should be sent to the hospital. Many rectal conditions can be cared for successfully without hospitalization, but one must select his cases carefully. One factor which always must be seriously considered is the temperament of the patient. An attempt to secure anesthesia and perform an operation in an office upon a nervous highly-sensitive patient, is seldom satisfactory.

Even if the operation is completed, the home care of the patient will likely be most trying on the physician's time and patience.

In cases where pain is experienced, adequate anesthesia is essential. The anorectal region is a very sensitive one, and operative procedure cannot be carried out satisfactorily if the patient cannot coöperate because of pain. In most cases, infiltration anesthesia, using one per cent procaine with three minims of ephedrin to the ounce, is a readily available and satisfactory anesthetic agent. For more extensive conditions, local infiltration of the skin about the anus combined with four-point pararectal injections—one anterior, one posterior, and one each laterally, right and left—will allow ample dilatation of the anal canal and permit the performance of most not too extensive rectal operations. For this type of anesthesia, approximately two ounces of solution are required. For smaller lesions, infiltration about the involved area is all that is required. In the case of dilatations, the incision of abscesses or other procedures requiring but a short time, either local infiltration or the intravenous use of evipal or gas oxygen inhalation anesthesia may be used if available. In the case of evipal, one gram is dissolved in ten cc. of sterile water. The solution is slowly injected intravenously with the patient counting. He will usually fall asleep by the time four to six cc. of the solution has been given. If the needle is left in the vein, a little more can be injected if needed.

Perhaps the most frequently seen condition which is suitable for office care is that of external hemorrhoids, thrombosed or otherwise. If only one hemorrhoid is to be treated, the base of the pile is infiltrated with novocaine. An elliptical portion of skin is then removed from the surface of the pile. The extent of the ellipse is estimated so that when the clot or redundant vessels are removed the margins of the cut skin can be approximated, leaving a smooth surface. Simply making a linear incision in such a hemorrhoid will result in a skin tag being left, and not infrequently, enough blood will ooze back underneath the skin to form a hematoma as large or larger than the original pile. We always approximate the skin edges with several interrupted 00 plain catgut sutures, which will control any bleeding vessels which may be present, and prevent the formation of a hematoma. If several hemorrhoids are to be removed, the procedure is repeated for each hemorrhoid, though for anesthesia, it is usually better to anesthetize the whole area by the four-point method, before beginning the operation. Internal hemorrhoids which are not constantly prolapsed, inflamed or fibrous, may be treated, if not too far advanced, by injection of sclerosing solutions.

This method is too well known to necessitate lengthy comment. Solutions recommended are a multitude; however, five per cent quinine urea hydrochloride, and five per cent phenol in olive oil, are as satisfactory as any others. It is much better to familiarize oneself with one or two solutions and to know how to use them and what results can be expected from them, than to try every new "improved" solution which is constantly being called to the attention of the medical profession. The

quinine solution should be injected deep into the hemorrhoids, using from one to three cc. of solution. Enough should be used to moderately distend the hemorrhoids. If the patient is to be ambulant, one or two hemorrhoids should be treated each time. In the case of the phenolized oil, the solution should be injected just underneath the mucosa above the upper pole of the pile, and also under the mucosa covering it. From two to five cc. is the usual amount. Our own custom is to never reinject a hemorrhoid while any induration is left from the previous injection. In other words, injections are not done on a basis of time between injections. To reinject a hemorrhoid which is still indurated invites a slough. Injections should be continued until all vestige of the hemorrhoid has disappeared, and this may be a matter of several weeks. If this is not done recurrence is certain. Attempts to produce a permanent result by two or three injections are futile.

Anal fissure if uncomplicated by other pathology, may also be cared for in the office. In case of surgery, the tissue under the fissure is well infiltrated with anesthetic solution. Incision is made through the base of the fissure and carried down through a portion of the sphincter fibers. Over-hanging edges are trimmed back. If a sentinel pile is present externally, it is removed, and if there is an infected crypt cephalad to the fissure, it is excised. A newer method of treatment, and one often satisfactory, is the use of the various oily anesthetics. One of the best is nupercaine in oil (nupercaine $\frac{1}{2}$ per cent, phenol 1 per cent, benzyl alcohol 10 per cent, in oil of sweet almond). In this case five cc. of the solution is slowly injected in a fan-like manner underneath the base of the fissure. This will produce a lasting anesthesia which relieves the patient's pain and relaxes the spasm. The fissure is treated with five per cent silver nitrate or other mild applications. If a sentinel pile is present it must be excised. This may be done a few days after the injection of the nupercaine solution, often without additional anesthesia.

Perirectal abscess, whenever possible, should be operated upon in the hospital, for usually adequate operation is difficult or impossible as an office procedure. However, if the patient cannot go to the hospital at once, the abscess should be incised as this will relieve tension and pain. More important it will stop the further extension of the abscess which, until tension is relieved, will continue to increase in size. These are ideal cases for evipal anesthesia, but incision may be done by infiltrating a small area over the abscess with novocaine. The injection of the solution into acutely inflamed tissue is painful, but can be accomplished if care is used.

In the case of pruritus ani, it is our custom to relieve the condition by local applications and other medical methods before resorting to more radical measures. The reason for this is that only too often the condition may recur regardless of what is done surgically or otherwise. If any local condition is present which tends to produce local irritation, it should be cared for. If skin tags are present they should be removed under local anesthesia, since they present mechanical difficulties in caring for the involved area. To give immediate relief from the

intense itching, the entire affected area may be infiltrated subcutaneously with a solution which will produce a prolonged anesthetic action. There are a number of these solutions but nupercaine in oil or benacol are satisfactory. One quadrant should be slowly injected with five cc. of the solution. If this is done very slowly, little pain is experienced. The other three quadrants are injected at 24 to 48-hour intervals. If any area is missed, it may be picked up later. Temporarily this will often give complete relief, and in the meantime measures may be instituted to clear up the excoriations and other inflammation of the skin. The result may not be permanent but it will at least tide the patient over his severe attack.

Polyps of the rectum are most often single. Polyps may be hard and fibrous, or the soft adenomatous type which bleeds easily. The term polyp indicates a pedicle, but by custom, lesions which originate from the rectal mucosa and project above its surface are usually included in this general group. In all these lesions, except the fibrous type, it must be kept in mind that malignant degeneration may occur. In fact, even in small lesions of this type, microscopic examination may show them to be malignant. For this reason it is essential that they be destroyed. Pedunculated lesions, if low down in the rectum, may be ligated close to the rectal mucosa and then removed. Non-pedunculated lesions may either be excised or destroyed by coagulation or fulguration. In the case of flat lesions, they should move freely with the rectal mucosa. If there is adherence to the underlying muscular coat, the chances are that one is dealing with an early cancer. The factor of malignancy must always be borne in mind in dealing with these tumors. If the growth is so high up that ligation is too difficult, the most satisfactory treatment is coagulation or fulguration, which can be done through the proctoscope. An occasional postoperative examination is advisable to be sure that there is no tendency to recurrence.

Simple fistula in ano may also be cared for in the physician's office. Many graded or fractional operations have been devised to care for more complicated fistulas in an ambulant manner. In my experience, where there is more than one superficial tract extending straight into the rectum, it is better to send the patient to the hospital. The patient has less pain than from repeated partial operations and the total disability is no greater. Curing a fistula by repeated fractional operations in the office always reminds me of the kind-hearted gentleman who cut the dog's tail off an inch at a time so it wouldn't hurt him so much. One is never certain that some tract undiscovered at examination may exist, which would be difficult or impossible to deal with in the physician's office; but with the patient in the hospital, the surgeon is prepared to meet any emergency which may arise. In the case of office operations, the tissue about the fistula should be thoroughly anesthetized by local infiltration. A probe is then passed through the fistulous tract and the over-lying tissue divided from the internal to the external openings. We now have an incised wound, and the overhanging edges are removed leaving a broad

flat wound, which is the principle of the treatment for all fistulas. The fistulous tract is curetted and probed for lateral tracts, but the scar tissue need not be removed. Bleeding is controlled and a wick of gauze placed in the wound. The wound is not tightly packed nor should it be subsequently.

All suspicious rectal growths should be subjected to biopsy, but biopsy in most cases is not an office procedure. One must be sure that he actually secures a portion of the tumor, and this often requires a "bite" deep in the mass. Too often a piece of pendulous mucosa or inflamed tissue is all that is secured by a biopsy made in the office. In this case real harm has been done, for the physician, relying upon the microscopic findings, often treats a malignant condition conservatively until too late for radical surgery to be of any benefit.

The postoperative care of the ordinary rectal cases is simple, but it is important. Many of these operations are attended with considerable after-pain and soreness. After office operation, it is our custom to prescribe one grain of codine sulphate, one-third grain of pantapone, or one-twenty-fourth grain of dilaudid, to be taken by mouth every three or four hours as it is needed for pain. If the pain is less severe, a capsule containing five grains of aspirin, five grains of phenacetin, and one-half grain of luminol, will suffice. Local application of heat, either moist or dry, is most comforting. Twenty-four hours later hot Sitz baths lasting 15 to 30 minutes are begun and continued twice or more daily. These are very helpful in relieving pain and also in promoting

healing. Local applications of anesthetic ointments are beneficial. Nupercainal, pantocain or diothane ointments are satisfactory. They should be used with some care for we have seen cases of protracted generalized dermatitis with extreme itching, following the use of nupercainal. Daily installations through a soft rubber catheter or blunt medicine dropper of small amounts of the milder mercurial antiseptic solutions or witch hazel, seem to be of benefit.

Care of the bowels is most important. Hard stools soon after operation may cause severe pain and likewise they may traumatize the surgical wounds to the extent of causing hemorrhage. Too frequent bowel movements will also produce pain through mechanical or chemical irritation. The ideal arrangement is to secure one or two soft movements a day. This is best accomplished by the use of mineral oil, given two or three times daily. The dosage can usually be quite accurately gauged by inquiring about the usual bowel habits of the patient and governing the dosage accordingly. Where bowel movement is not secured, an injection of six ounces of mineral oil and an equal amount of water, may be given as an enema through a soft rubber catheter. Soap suds and other irritating solutions should not be used.

In cases where there are wounds in the anal canal or at the anal margins, the buttocks should be retracted daily, and the physician be sure that skin margins are not healing too rapidly or that no bridging over of tissues is occurring. With this simple after-care, the patient usually can be made comfortable; and in a few days or weeks, as the case may be, recovery is complete.

Uterine Surgical Problems in General Practice*

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THE endometrium is the most active tissue in the human body. It does not have a resting period because the normal tissue is constantly proliferating, differentiating and finally is cast off in the first twenty-four hours of the menstrual period. Normal menstrual blood does not clot. Any process which interferes with the physiologic control of the endometrium will bring about changes in menstruation that may require surgical treatment. If the uterus is entirely normal, the oviduct or ovary must be suspected of being the cause. Systemic disease rarely influences menstruation.

Menorrhagia and Metrorrhagia

Irregular or profuse menstruation with or without associated symptoms is one of the most frequent complaints among women. Its cause is often one of the most difficult to determine. The numerous factors that can interfere with the normal physiologic process often

are obscure or are complicated by physiologic reactions which, as yet, are poorly understood. Irregularity or profuse menstruation should be investigated thoroughly without delay because too frequently disregard for these signs leads to serious and often fatal results.

The age of the patient who has irregular menses is important. For example, if a woman in her second and third decade of life states that she always has had irregular periods, such a condition is almost certainly to be attributed to a state of "ovarian dysfunction," which means that either the normal estrogenic or luteinizing functions of the ovary are disturbed. The pituitary gland is known to have a definite influence on these processes. Thus, the irregularity may be caused by an abnormally functioning pituitary gland.

The activity of the endometrium may be arrested in any phase of its development. For example, folliculin, the hormone which controls the proliferative process that occurs immediately after menstruation, may cease

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to act. This condition of the endometrium is known as a persistent or arrested proliferative phase. This is accompanied frequently by persistent and irregular bleeding. The same sequence of events may come about during the differentiative phase, or latter part of the menstrual cycle. This phase is said to be under the control of the hormone of the corpus luteum so that failure of ovulation is one of the factors that may disturb it. The endometrium becomes cystic and, often, molimina and long periods of amenorrhea develop. The diagnosis must be made by correlating the clinical evidence with the results of microscopic examination of the endometrium. Treatment just now consists mostly of administration of substitution products derived from the thyroid gland, pituitary gland or ovary. In some cases judicious use of radium and roentgen rays is helpful.

The surgical treatment of ovarian dysfunction is extremely limited and, except for diagnostic curettage, is rarely justified. It is in this group of young women that, too often, repeated curettage and multiple pelvic operations, such as suspension of the uterus, salpingo-oöphorectomy, resection of the ovaries and, finally, hysterectomy with all the attendant emotional disturbances are performed. I refer to this type of surgical therapy to point out the necessity of determining, in so far as is possible, the basic causes of menstrual disturbances among young women. Curettage, for instance, is rarely indicated except as an aid to diagnosis, or as a means of arresting hemorrhage by removing retained products of conception. Furthermore, menorrhagia is not often caused by a retroverted uterus but suspension of the uterus is performed frequently as a curative measure. Retrocession or retroversion of the uterus occurs, at some time, in about 30 to 40 per cent of young women but the point is that the uterus does not become adherent in that position except among those who have pelvic inflammatory disease or endometriosis. In addition to disturbed menses, pain, in such instances, is an extremely prominent symptom.

Beyond the third decade of life the diagnostic problem becomes more complicated because carcinoma of the cervix, leiomyoma and conditions accompanying childbirth are encountered. Spotting between periods or bleeding following sexual intercourse is highly suggestive of an inflammatory lesion of the cervix and, on account of the incidence of malignant lesions of the cervix, prompt investigation is imperative. The patient may disregard the early signs before consulting her physician but the burden of proof rests on him to prove the presence or absence of malignancy once the patient does consult him for diagnosis. We are not justified in prescribing any type of therapy until a careful clinical study and microscopic examination of biopsy specimens have been made.

Surgical removal of the entire uterus for carcinoma of the cervix is rarely thought to be indicated in this country, but in certain sections abroad it is the procedure of choice. The reasons why carcinoma of the cervix is

not regarded as a surgical disease in this country are chiefly that, in 90 per cent of the cases, the lesions are inoperable when they are first seen, and that these lesions are usually highly malignant and the cells, for the most part, are radiosensitive. Only about 5 per cent of such lesions are slow in development and are somewhat more resistant to radium and roentgen therapy. The Wertheim abdominal hysterectomy or the Schauta vaginal hysterectomy alone or combined with radium therapy might reasonably be considered good treatment for this less malignant group of lesions.

Recurrent bleeding or vaginal spotting after the menopause is highly suggestive of carcinoma of the fundus. However, this must not be considered entirely as a post-menopausal disease because it does occur frequently in the early premenopause. For this reason, its presence must be suspected until it is definitely proved at operation to be absent. The pathologic picture is essentially opposite to that of carcinoma of the cervix. The lesions, in approximately 90 per cent of the cases are of a low grade of malignancy and are designated by some as "adenoma malignum." The smaller group, adenocarcinoma, is highly malignant.

The treatment considered by most physicians is surgical removal of the entire uterus and adnexa supplemented by radium and roentgen therapy. Surgical removal of the uterus alone is not regarded sufficient to effect a cure. In some clinics, a preliminary course of intra-uterine radium therapy or deep roentgen therapy or both are advocated, followed in six weeks by performance of total abdominal hysterectomy. In the Mayo Clinic, radium is administered to the vaginal vault and roentgen therapy is applied to the front and back of the pelvis after total abdominal hysterectomy has been performed in cases in which lesions are grade 2, 3 or 4 (on the basis of 1 to 4). We do not regard it as of any value in the treatment of lesions, grade 1.

In this same age group, leiomyoma is one of the most frequent causes of disturbance in menstruation. Hysterectomy for this condition is, perhaps, the most frequent pelvic abdominal procedure. It is rare to encounter these tumors among women who are less than twenty-five years of age but the incidence increases progressively to the fourth decade of life. The incidence is definitely higher among women who never have been pregnant and it is on record that it is much higher among women of colored races than it is among women of the white race, the ratio being about 9:1. Seventy-five per cent of colored women more than thirty-five years of age have myomas, especially if such women have not had children. The tumors are usually multiple; a single myoma rarely is encountered, probably in not more than 5 per cent of cases. Not all benign tumors will require treatment, but surgical treatment will be necessary in many cases, as a result of degenerative changes, symptoms of pressure and hemorrhage.

The situation of the myoma in relation to the uterus is important in selecting the type of surgical treatment. Most myomas are found in the body of the uterus either

on the anterior or posterior wall. They are considered to originate within the myometrium and their ultimate situation is determined by their direction of growth, which may be toward the uterine canal or toward the surface of the uterus. Those which develop high in the fundus and extend toward the peritoneal surface seldom cause any difficulty during myomectomy, which is the operation of choice unless the uterus has been hopelessly destroyed by the growth. Difficulty does arise when the tumors originate in the lower portion of the fundus and extend laterally into the broad ligaments, or anteriorly into the base of the bladder or posteriorly into the cul-de-sac or into the folds of the mesocolon.

If the surgeon does not wish to remove the uterus, some very serious problems arise. For instance, laterally, the uterine artery and veins pass either in front of or behind the base of the tumor and it often is safer to divide these vessels rather than risk severe bleeding by retracting them. The ureter, in such instances, is pushed from its normal position and, unless it is visible, it is likely to be injured. Tumors that extend anteriorly near the base of the bladder usually are rather firmly attached to the wall of the bladder. It has been my experience that, if injury to the wall of the bladder occurs during removal of the tumor, it is safer to excise the segment of bladder that is attached to the tumor rather than take the chance of producing a vesical fistula. The bladder can be closed safely with two rows of catgut sutures. The tumor that grows posteriorly under the peritoneum of the cul-de-sac is rare but, when it does occur, its removal without hysterectomy is likely to produce pain from subsequent fixation of the uterus.

Myomas that grow toward the uterine cavity are often difficult to identify unless they are 4 to 5 cm. or more in diameter or become extruded through the external os. These tumors tend to undergo degeneration and tend to become soft and necrotic. Profuse and prolonged bleeding at the menses occurs frequently and is associated with severe secondary anemia. At examination these tumors may be overlooked because the contour of the uterus is normal. The patients, too often, are given a castrating dose of radium or roentgen rays. In cases in which the patients are less than forty years of age, myomas should be removed surgically. Many submucous myomas can be extracted by grasping the tumor with a tenaculum and twisting it gently. Bleeding is rarely a troublesome factor and can be controlled by a uterine pack. Myomas of large size can be approached adequately by vaginal hysterotomy. This is the safest method if there are multiple submucous tumors. If infection is not present and there are other tumors in the myometrium, an abdominal myomectomy is the preferable operation. When there is much infection, as there always is in submucous pedunculated myomas, the performance of abdominal myomectomy, if indicated, should be delayed several weeks or months until all infection has subsided.

The bleeding and foul vaginal discharge which so often are noted in connection with a pedunculated vaginal myoma may be mistaken for carcinoma of the

cervix. In the latter condition, the prognosis naturally would be altered considerably. Manipulation of these sloughing myomas must be accomplished without instruments. The tumor may be pulled into view by the hand and its pedicle examined with the finger. The pedicle is clamped adjacent to the wall of the uterus and excised. Bleeding can be controlled by leaving the forceps attached or by packing the uterus with gauze.

The decision as to whether total or subtotal abdominal hysterectomy should be performed for benign conditions is determined principally by the condition of the cervix. In cases in which hysterectomy is contemplated, the cervix should be inspected carefully and palpated. Cervical erosions and lacerations, endocervicitis, cystic cervicitis and polyps, all indicate an unhealthy cervix. The external os may be firm and smooth and active endocervicitis may be overlooked. Cysts situated in the cervical canal may extend to the internal os and each cyst may be infected. In cases in which cervical polyps tend to recur, it has been observed that malignancy is very likely to develop later. Considerable research has demonstrated that the cervix is a frequent source of infection and that such infection has a definite relation to other infectious processes within the body, such as infections of the small joints, retinitis and choroiditis. There is a very definite relationship between infections of the cervix and infections of the urinary tract as some of the lymphatics of the cervix extend directly to the base of the bladder and, also, upward along the ureters and to the pelvis of the kidney. A suspension of graphite injected into the cervix finds its way almost immediately to the submucosa in the region of the trigon of the urinary bladder. This is evidence of the paths of infection. Furthermore, a cervix which grossly appears to be normal often becomes a source of infection following subtotal hysterectomy, as a result of interference with its normal blood supply and cessation of its normal physiologic action. Therefore, frequently a retained cervical stump must be removed on account of its residual inflammatory character. For these reasons it becomes an increasingly difficult problem to say what patients should be treated by subtotal hysterectomy as it is impossible to determine whether or not a cervix will continue in a healthy state after such an operation has been performed.

In order to avoid some of the technical difficulties associated with total abdominal hysterectomy, subtotal abdominal hysterectomy has been substituted and the cervix is then coned out, cauterized or even repaired or amputated. None of these methods of handling the cervix affords much protection against the later development of carcinoma. Also, numerous infected cervical glands often are opened or only partially destroyed; this leaves an infected tissue which is prone to heal slowly and irregularly. I have seen cases in which the external os closed early before the upper portion of the cervical canal had healed; this was followed by formation of an abscess. The infection extends to the broad ligament and cellular tissue and, therefore, contributes to a prolonged convalescence and to morbidity.

I wish to emphasize that the discovery of one or two small myomas during the course of examination is not an indication for their immediate surgical removal. Such tumors may not cause symptoms for years and the patient even may become pregnant several times without any harm being done. Many patients who have small fibroids that do not produce symptoms are treated with radium when the indications for such treatment are not sufficient, and, in fact, when this form of therapy is contraindicated. In the treatment of the healthy young woman who has a myoma, radium therapy is a very destructive method and is one that is not considered conservative.

Endometriosis

Pain and discomfort associated with small benign tumors of the uterus usually signify the presence of adenomyoma, especially if the discomfort is intense at the time of the menses. The distress, in these instances, tends to diminish slowly following menstruation. It is important to distinguish clinically, so far as possible, between adenomyoma and leiomyoma. The former rarely assumes a submucous or a subperitoneal position because it is attached intimately to the myometrium. There are no planes of cleavage as in cases of fibromyoma and it must be excised by sharp dissection. This tumor becomes quiescent after the menopause but during the reproductive period of life, surgical removal is often necessary because this type of tumor becomes activated, to a certain extent, by ovarian stimulation.

Adenoma may be discrete within the uterus or diffuse; the condition often is designated as internal and external adenomyosis. This condition frequently is referred to as endometriosis owing to its resemblance to the endometrium. In addition to discrete adenomyoma within the uterus, the question of the proper treatment becomes more complicated when there are diffuse implants involving the ovaries, posterior surface of the uterus and the peritoneum of the cul-de-sac and rectum. The process increases progressively and the most severe involvement is encountered among patients aged thirty to thirty-five years. However, during recent years, the condition has been observed among patients who were considerably less than thirty years of age, which fact probably reflects the factor of more accurate diagnosis as a sequel to the general interest in this disease. It is of interest that the majority of these patients are sterile or, if they have had children, subsequent sterility apparently is associated with the onset of endometriosis. The explanation seems to be that the adnexa become adherent under the broad ligament and implantation on the ovary and the production of hemorrhagic cysts interfere with ovulation. The fallopian tubes, except for adherence of the fimbriated ends, are remarkably free from the disease. It is rare to find only one of the adnexa involved; in such cases there are implants on the uterosacral ligament, uterus or rectum.

The treatment is surgical and should be conservative in type whenever the process is not extensive, but those cases in which employment of conservative measures is

possible, I believe, will not exceed 50 per cent. In cases in which the lesions are extensive, complete removal of the pelvic organs is necessary, although the patients may be aged forty years or younger. Conservative surgical methods, which have a better chance of success in cases of early involvement, consist of local excision of the implants and resection of both ovaries or, perhaps, removal of one of the adnexa. It has been my experience that the relief of dysmenorrhea is more complete if, in addition to local excision, resection of the presacral nerve is performed. Because pain is evidence of recurring trouble, I believe that many patients can be kept rather comfortable by this method until later years in life when they can be relieved by a castrating dose of roentgen rays or by radical surgical measures without the production of too great a degree of emotional imbalance. If the disease is so diffuse that complete removal of all the pelvic organs is necessary and if the patient is a young woman, it has been my custom to save the healthiest portions of both ovaries, shave them into fine segments and transplant them above the rectus fascia adjacent to the perforating blood vessels in the abdominal fat. These segments of the ovaries grow and become active in about eight weeks; the activity occurs four or five days each month coincident with ovulation. The patient may experience an artificial menopause in the period during which the grafts are growing; then the patient is either partially or completely relieved depending on the success of the graft. Should the grafts become cystic or painful they are very accessible just beneath the skin and can be excised surgically or destroyed by application of radium. So far, I have not found it necessary to remove any graft. In one corpus luteum cyst a small clot formed which was easily evacuated without harm to the graft.

Pelvic Inflammatory Disease

Pelvic infection, whether it is gonococcal or streptococcal in origin, may become of surgical importance. Our chief concern is to ascertain, in as nearly correct fashion as possible, when the disease requires surgical treatment and how extensive this treatment should be. This may vary from performing colpotomy for drainage of a pelvic abscess in the acute or subacute stage to that of panhysterectomy in the chronic stage. Fortunately, there are fewer patients than ever before who have acute pelvic infection who are being treated surgically. This is attributed to the good results that have been observed following fever therapy and, more recently, following the administration of sulfanilamide in judicious doses, particularly in case of infection by certain strains of the gonococcus. There are other patients who are resistant to either method of treatment, but respond more favorably when the treatments are combined. The results seem to indicate that surgical treatment in cases of subacute gonococcal inflammatory disease will be chiefly that of tubo-ovarian abscess. Some of these abscesses will subside under conservative care so that, unless symptoms have persisted for some time, one should be hesitant to apply surgical treatment too early.

There are some specific infections that become persistently chronic and have been subjected previously to incomplete surgical measures which require further consideration. In addition to these, there are the clearly defined postabortal infections and those infections of low grade which originate mainly in the lacerated cervix and extend through the lymphatics to the broad ligaments, uterosacral ligaments and the adnexa. These patients may carry on their activities for years but with occasional exacerbations and the associated disability. I wish to emphasize that it is among these patients that further conservative measures are most likely to fail and that surgical treatment, in most instances, should consist of panhysterectomy. Whether subtotal or total hysterectomy should be performed, should be governed by the condition of the cervix and the amount of edema in the cellular tissues. However, the cervix usually is infected and metritis also is present. In conditions of this type which are of long duration, the infection which usually is streptococcal in type extends to the lymphatics of the broad ligaments and to the lymph nodes along the iliac vessels and, occasionally, to the inguinal regions. Unless the extent of infection is estimated carefully, subtotal hysterectomy may be followed by extensive cellulitis of the broad ligaments which involves all the pelvic tissues. The convalescence is then prolonged from three to six weeks and the cervical stump becomes fixed and edematous and, if it is touched, it is painful. This sequence of events is most likely to follow retention of the cervical stump in postabortal infections which have a tendency toward exacerbation following menstruation or trauma of any type. It also is characteristic of that group of cases in which surgical interference previously has been performed in the subacute or early stage and in which residual infection manifests itself by pain, discharge, occasional fever and disability. Under such circumstances, total abdominal hysterectomy with removal of both adnexa is the safest procedure and gives the best assurance of complete restoration of health, because all tissues that are infected are removed and the lymphatic involvement subsides rapidly. I am sure that subtotal hysterectomy in this group of cases is potentially a more dangerous procedure than total abdominal hysterectomy and has been followed by more complications and deaths than total removal of the uterus and adnexa.

Summary

The endometrium is one of the most active tissues in the human body and this activity is under the control of ovarian hormones. These hormones are controlled

indirectly, in some obscure fashion, by the pituitary gland. Many disturbances in the menses among young women are caused primarily by disturbance of the interrelation of the pituitary and ovarian hormones. The histologic picture of the endometrium usually gives some indication as to whether the estrogenic or luteinizing hormone is defective. Surgical correction of retrodisplacement or partial resection of the ovaries usually is ineffective in controlling the profuse and irregular menses.

Disturbances in menstruation among women aged thirty years or older demand a very careful search for submucous fibroids or malignancy of the cervix. The surgical treatment of myoma occurring among patients aged thirty-five years or younger should be myomectomy with preservation of the menstrual and, if possible, the reproductive functions. Hysterectomy among young individuals rarely is required unless the uterus has been destroyed extensively by the myomas. Uterine bleeding during or after the menopause is suggestive of carcinoma of the fundus. The treatment for malignancy of the fundus should consist of panhysterectomy supplemented by the application of radium to the vaginal vault and roentgen therapy over the front and back of the pelvis. In some institutions, hysterectomy is preceded by a thorough course of intra-uterine radium or roentgen therapy, or both.

Pain and discomfort associated with benign tumors of the uterus are usually suggestive of the presence of adenomyoma. The adenomyoma may be discrete or multiple. The treatment is surgical and should be conservative whenever the process is not extensive. However, those cases in which the use of conservative methods is possible, I believe, will not exceed 50 per cent. When the process is extensive, total abdominal hysterectomy with removal of all ovarian tissue is the operation of choice. Among younger patients, it is frequently safe to transplant some ovarian tissue to the abdominal wall.

Surgical treatment is indicated rarely in cases of acute and subacute pelvic inflammatory disease, except for drainage of an abscess. Postabortal infection which has existed for years and a low grade of infection of the broad ligaments which originates from an infected cervix are handled more satisfactorily by total hysterectomy than by subtotal hysterectomy. When subtotal hysterectomy is performed in chronic cases, extensive cellulitis may occur, resulting in a fixed cervical stump with an increased mortality and morbidity.

The Doctor in Health Education*

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THE time is past when the medical profession debates whether or not to give health education to the public. On all sides the public is being "educated" with relation to its health, and we find among the ranks of eminent medical authorities cited in certain types of advertising, the Pullman porter, who recommends an alkalinized laxative as a means of saving the honeymoon when the bride develops a cold. I could multiply examples like this many times, but there is no necessity for doing so, since physicians are thoroughly familiar with the specious and unsupported claims made in the name of health for products and services of all types and varieties of usefulness or uselessness. The doctor today must not be silent in the midst of all the voices clamoring in the name of health.

It is important to distinguish between health teaching and medical teaching. No one with experience in health education advocates attempting education of the public in medicine. Education in health, hygiene and appreciation of medical services is necessary. Education in medicine should be reserved for the doctor.

The first question to be decided is whether it is ethical for the physician to communicate with the public for purposes of health education. The medical profession, through its numerous state and county medical societies and through the American Medical Association, carries on communication with the public on behalf of organized medicine, as such. This is not contrary to the principles of medical ethics, which prohibit the use of advertising or publicity for the exploitation of individual physicians in their own interest. Communication with the public by organized medicine is a public service and as such it is in accord with the ethics of the profession which exist, according to the constitution of the American Medical Association, to promote the science and art of medicine and to protect the public health.

The principal media for health education by the doctor are the radio, the platform address, the printed word (magazines or pamphlets), and the exhibit.

The most interesting of the media is radio. In spite of the fact that radio has become a commonplace in our lives, we are still mystified when we stop to consider that words of more or less wisdom whispered into a microphone in New York, Chicago or Hollywood, may be heard in millions of homes. We no longer believe, as we did at one time, that every radio program has innumerable listeners. We now know that the poor program soon loses its listeners and that programs following on the same station also suffer loss of audience. It is, therefore, important that we shall not be content with mediocre material to put on the air. We must make it as good as we know how.

The radio talk, consisting of a prepared manuscript read consecutively for five, ten or fifteen minutes, is the most common and the least effective radio health message. Unless written by one with unusual capabilities and delivered in an exceptionally able manner, it usually leaves the listener bored. A more lively presentation is the question and answer method, providing the common error is avoided of making the questions brief and the answers lengthy and of making the questioner appear like an ignorant "stooge", while all wisdom radiates from the physician who provides the answers. An effective question and answer talk should consist of an interchange of short questions and brief answers delivered in a natural manner and not without appropriate humor. Still more effective is the round table, in which four or five persons discuss a subject from notes which have been previously rehearsed. This, too, must be spontaneous and natural. The best presentation of all is by means of dramatization, as done by the American Medical Association and the National Broadcasting Company in its weekly radio program *Your Health*.

Dramatizing the health program is more time-consuming, laborious and possibly more expensive than other methods, but it is the best method. It can be done on local stations with little or no expense, by interesting a local group of amateur dramatic players, a Little Theatre, or a high school drama class. Such entirely local productions may not be theatrically equivalent to the finished product of the radio networks, but they have a very definite local value through the interest which is aroused by participation of various groups and individuals.

The American Medical Association has a supply of radio talks, radio interviews and radio dramas which may be used by a medical society on request, without charge.²

The second medium is the platform address. Numerous lay organizations eagerly welcome competent medical speakers talking to them on health. It is important for the physician to realize at the outset that a presentation which will be highly successful before a medical audience will be a total failure before a lay group. For example, a talk on "The Physiology, Pathogenesis and Therapeutics of Essential Hypertension" might be a suitable title for a medical paper, but in dealing with this subject for a lay group a far more appropriate title might be "The Low-Down on High Blood Pressure." In the same way you could announce a talk entitled "The Importance of Cleanliness, Diet and Sleep and Individual Personal Hygiene" and you might get an audience if there was nothing better to do at the time. If, on the other hand, you announce such a simple title as that used by Dr. Paul A. Teschner for his talk on hygiene, which he calls "Eat, Sleep and Wash," there

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is much greater likelihood of an audience. Medical societies, even in small communities, can well afford to have it known that their members will address local groups on health topics. The groups should be encouraged to ask for speakers on certain subjects, but the designation of the individual physician to make the talk should be by the medical society. Moreover, the speaker should present the consensus of medical opinion on his topic, not his own ideas only. His remarks should be reviewed, for his own protection, prior to delivery and he should be pledged to confine himself only to approved material. This is not censorship; it is substitution of group for individual judgment.

There are so many ready-made audiences in Rotary Clubs, Kiwanis Clubs, Lions Clubs, Women's Clubs, study groups, P.T.A.'s and the like, that it is usually best to send the speaker where the listeners are. On the other hand, successful public meetings have been arranged in connection with state medical society meetings. Such public meetings require a great amount of intensive preparatory work. Newspaper announcements alone are not enough. The best success usually attends the issuance of tickets which are distributed free, but with the distinct understanding that they will be given only to those who have a genuine intention of attending the meeting. Programs for such meetings should not be too long, but on the other hand, the mere presentation of a speaker is, in itself, an inadequate program. A good general outline for such a program is to have a well known citizen presiding and to have a few remarks by the president of the state medical society and the president of the county society; a musical selection by a high school orchestra or a local chorus might come next, then the speech, and a musical selection in closing. It is often a good idea to have the high school band present to play for thirty minutes preceding the meeting, thus helping to entertain the early comers. The more groups and individuals can participate in the meeting without prolonging it unduly, the more interested friends and relatives will attend the meeting and thus get the speaker's message.

The American Medical Association has developed a list of 76 popular topics for doctors speaking to lay groups. On each topic it offers the loan of a collection of material and a proposed outline for a talk. This material has been so popular that doctors wishing to borrow it are advised to give at least a month's notice. There is no charge for the loan, except return postage.

The printed word will not be developed locally, since publication of magazines, like *Hygeia*, and pamphlets, such as those issued by the American Medical Association, can be accomplished economically only on a nationwide basis. Local use, however, is important. The manner in which the Women's Auxiliary has supported *Hygeia*, placing it in schools and libraries, is a case in

point. Many of the pamphlet publications of the American Medical Association would be useful in a doctor's office, either in the waiting room for his patients to use, or handed out by him to supplement his instructions. Two pamphlets especially, *A Child Is To Be Born*³ and *Keeping Your Baby Well*,⁴ are suggested for this purpose, being useful in obstetrical cases and infant care problems particularly.

Hygeia should be useful in the waiting room of every physician, interpreting him to his patients, combatting quackery, exposing fads and fallacies and creating a useful background of health information which makes the patient more responsive to appropriate suggestions from his physician.

The exhibit is a technic which has great value, but is frequently poorly applied. Putting up fifteen posters on a wall does not constitute placing an exhibit. A good exhibit is like a good painting; it is a unit with a unified idea, not just a conglomeration of objects. A good exhibit requires an attendant to explain and demonstrate the material. Exhibits are effective in state and county fairs and in so-called halls of health, such as was pioneered by the State Medical Society of Wisconsin.⁵ Exhibits can be developed locally, with the exercise of industry and ingenuity and without spending very much money. The American Medical Association has certain exhibits which are available on a loan basis, return transportation being the sole consideration. Plenty of time should be given the Bureau of Exhibit when the loan of exhibits is desired.

The Bureau of Health and Public Instruction⁷ of the American Medical Association will be glad to cooperate at any time with county societies, their committees, or physicians acting on their behalf, in matters relating to health education. Dr. Rock Sleyster, while a trustee of the American Medical Association, made the statement⁶ that the Association headquarters is essentially an ammunition factory. That means that state and county medical societies, who are on the firing lines, must use the ammunition.

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Medical Relief in North Dakota*

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MEDICAL relief is the most difficult of all relief activities to administer. This is particularly true in a period of depression such as we have been passing through, when a very considerable percentage of the population is in need of public assistance.

The Honorable Harry L. Hopkins recognized this during the FERA program when we requested authority to use FERA funds for medical aid in those counties where, through lack of funds, it was impossible for the counties to continue to finance medical relief. He warned us of the difficulties of administering medical relief and the danger of expenditures reaching unwarranted proportions.

We all recognize the fact that the medical needs of the sick poor are not now, and never have been, met satisfactorily. An adequate and satisfactory medical relief program would involve corrective and preventive, as well as emergency care. Such a program, under present conditions, is obviously impossible due to the inability of the taxpayers of the state to finance it.

At the present time approximately 60,000 families, or about 35 per cent of the population of North Dakota, is receiving relief of one type or another to provide for their subsistence needs—food, clothing, etc. Obviously, all of these families require public aid in case of sickness. In addition to the families on relief, a very considerable proportion of the other families in the state are on the borderline; that is, are just able to provide for their subsistence needs. They are unable to pay for medical care in case of sickness, not to mention corrective and preventive medical care, which most of them undoubtedly need.

All medical care, as well as other general relief authorized by and paid for by county welfare boards, must be financed by North Dakota taxpayers, out of state or county appropriations. By general relief we mean all assistance not provided by a Federal agency or included in the special assistance programs financed jointly by Federal, state and county funds, such as Old Age Assistance, Blind Aid, Aid to Dependent Children and Services to Crippled Children. No Federal funds for general relief have been made available since the discontinuance of the FERA in December, 1935.

The Legislature in 1937 appropriated \$3,500,000.00 for general relief, in addition to an appropriation of \$2,600,000.00 to provide the state's share of the special assistance programs. Of the \$3,500,000.00 appropriation, approximately \$2,700,000.00 had been expended in the fifteen months ending April 1. Because of the depleted appropriation, it was necessary for the Public Welfare

Board to very materially reduce the grants to the counties beginning May 1. This means that the counties will have to provide a much larger proportion of general relief funds, at least until the Legislature makes another appropriation.

Considering the financial condition of the counties, and the fact that most of them have been going further and further into debt during recent years due to poor tax collections and limitations on the amount of taxes the counties can levy, it is obvious that relief expenditures *must be decreased*.

Medical relief which must be confined to emergency conditions is much more difficult to administer than other types of relief. The relief requirements of a family for food, clothing, fuel and housing can be determined with considerable accuracy, provided we have a good case-work investigation to determine the resources of the family and the amount of assistance which is necessary. This is not true in the case of emergency medical care. The relief worker can determine whether or not the financial condition of the family is such that it is eligible for assistance, but he cannot determine whether the need for medical care is emergent, because of lack of medical knowledge. The worker must therefore depend upon the physician to determine whether or not the case is an emergency. In other words an effective administration of the medical relief program is entirely dependent upon the coöperation of the medical profession.

I am sure that the majority of our physicians appreciate the difficulties involved in medical relief and are gladly contributing of their time and talents to the solving of these difficulties. Unfortunately, this is not true for all. All that a few of our physicians have seen in the medical relief program is an opportunity to take advantage for personal gain. Because of these few doctors, difficulties in meeting this situation are greatly increased for all doctors. For example, consider the embarrassing position the family physician finds himself facing when a colleague determines a condition emergent which the family physician honestly and conscientiously declared not to be emergent. It may even mean the permanent loss of his patient. Some doctors are requesting unnecessary hospitalization. This is especially true for Farmers Mutual Aid cases, where hospitalization must be paid by the county welfare boards.

Because of limited funds and the absolute need for reducing relief expenditures, we earnestly ask the coöperation of all doctors in the state to eliminate unnecessary medical expenditures including the elimination of all non-emergencies, the prescribing of high-priced medicines and unnecessary hospitalization, in order that we may have sufficient funds with which to provide absolutely necessary emergency medical care.

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There are two general methods or plans for administering a medical relief program. One is the contract, or county physician plan; the other is the family physician plan. From the standpoint of administration, the contract or county doctor plan presents few problems and this plan is usually much more economical than the family physician plan. From the standpoint of the welfare of the client, the family physician plan is usually more desirable. However, this plan is generally much more expensive, and in addition presents very serious administrative problems due to the difficulties of keeping such a program under control.

The contract or county physician plan may vary considerably as to method of operation. It may include a county public hospital with a staff of physicians and surgeons maintained through public funds, with the best of medical care available to all indigent persons. It may be limited to employment of one full-time physician, who, in attempting to serve all indigent cases in the county, may, or may not be able to give adequate care. It may provide for a contract with all of the doctors in the county, each receiving a yearly salary, such salary based upon the percentage of the population of the county which he ordinarily serves.

One of the advantages of a contract or county physician plan is that the cost is very largely predetermined and the county can provide in its budget the funds required to meet the cost. The principal objection to the county hospital or single county physician plan is that it results in the breaking of family physician relationships. If all of the doctors in the county are under contract, family physician relationships are broken only when the family physician of the client resides in another county. When all of the doctors in the county are under contract, hospital costs are often excessive because of the tendency of *some* doctors to hospitalize many cases unnecessarily. This is due to the relatively low annual stipends often paid under this plan and the desire of the doctors to care for cases with a minimum outlay of time and effort.

The study of medical costs in North Dakota in 1937 shows that, in general, the cost of medical care per capita of total relief population was much lower under the county doctor plan. Undoubtedly, the family physician plan is the better from the standpoint of adequate and satisfactory medical care for the client, but the cost is much higher. With the state and the counties unable to provide funds to meet this additional expense, it may be necessary for all of the county welfare boards of the state to adopt the county doctor system. In fact, it is my frank opinion that the only way this can be prevented is for the medical fraternity themselves to devise methods of providing medical control.

When the problem of medical care was first considered, the Public Welfare Board, desiring to develop the best possible welfare program for North Dakota, went on record as favoring the family physician plan. In coöperation with the Medical Economics Committee of the State Medical Association, a maximum fee schedule

was agreed upon and recommended to the various welfare boards in the state.

Under our laws, responsibility for handling relief and welfare activities rests with the county welfare boards, subject only to the supervision of the Public Welfare Board insofar as the expenditure of state funds is concerned. Since the Public Welfare Board has no authority to compel county welfare boards to adopt the family physician plan, some of the counties continued the county physician plan in operation under the board of county commissioners. Other counties adopted the family physician plan, but adopted fee schedules different from those approved by the State Medical Association and recommended by the Public Welfare Board.

I believe there has been considerable misunderstanding, and perhaps some ill-feeling, on the part of some members of the medical profession because of the lack of uniformity in policies and in fee schedules in the various counties. That this lack of uniformity is unsatisfactory, not only from the standpoint of the physician, but from the standpoint of the relief client, is recognized. The State Board has for some time been struggling with the entire problem of medical relief with a view to formulating policies acceptable to the county welfare boards of the state, which will not only result in uniform practices, but which will reduce the total expenditures for medical care.

General relief expenditures include medical aid for WPA workers who are unable to provide medical care from their earnings, medical care for old age, dependent children and blind aid cases, and hospitalization, medicine and necessary dental care for farm grant clients, in addition to all relief needs of unemployable persons not provided for through the Social Security programs and supplementary aid to WPA workers and farm grant clients. Out of general relief funds must also come the administrative expenses necessary to operate the county welfare offices. A considerable personnel is required in the large counties, as the workers handle not only general relief cases, but they are responsible for taking all applications, making investigations and certifying relief applicants to WPA, FSA, NYA and CCC. They must also take the applications and make investigations for old age, blind, dependent children and crippled children cases which receive assistance under the public assistance programs. Considering the fact that more than one-third of the population of North Dakota is receiving relief of one kind or another, it can be seen that the job of the county welfare offices is a big and difficult one.

The problem which the counties face at the present time, considering the reduced state funds available for relief, is an exceedingly serious one. Many of the counties are fast approaching the time when they will be unable to borrow additional funds. Under the circumstances, it is imperative that relief expenditures in the state be reduced to a minimum.

To give you an idea of the relief problem in North Dakota, total relief expenditures of all kinds in 1937 amounted to more than \$21,000,000.00. This sum in-

cludes wages paid to urban relief workers by WPA, cash grants to farmers by the Farm Security Administration, payments to CCC boys, and payments to young people by the NYA, as well as direct relief granted by county welfare boards and assistance provided through the old age, blind and the children's programs. It does not include any administrative expense. Of the total, 87 per cent was Federal money disbursed by the WPA, FSA and other Federal agencies, and the Federal share of old age, blind and dependent children grants. Thirteen per cent of the total was state and county funds.

General relief expenditures by county welfare boards, financed entirely from state and county funds, which totaled almost two million, two hundred thousand dollars during the calendar year 1937 were distributed as follows:

Medical—Approximately \$772,000.00, or 35 per cent.

All other—About \$1,416,000.00, or 65 per cent.

The medical expenditures of \$772,000.00 were distributed as follows:

Physicians' fees—\$345,000.00, or 45 per cent. Hospitalization—\$335,000.00, or 43 per cent. Dental care—\$13,000.00, or less than 2 per cent. Nursing—\$21,000.00, or almost 3 per cent. Drugs, X-rays, and all other medical—\$58,000.00, or 7½ per cent.

These figures do not include the expenditures of the Farmers Mutual Aid Corporation for medical care and services, which amounted to approximately \$420,000.00; neither do they include medical care under the Crippled Children's program, which involved an expenditure of approximately \$80,000.00. These direct expenditures by relief agencies for medical care in North Dakota in 1937 total \$1,272,000.00. They do not include expenditures for medical care made by relief clients from WPA earnings, Farm Security grants, or Soil Conservation checks, which are in fact relief funds.

Evidence of the need for a more uniform medical program throughout the state is indicated by the great variation in the expenditures for medical care in the different counties. Medical expenditures in 1937 ranged from 10.4 per cent of total general relief expenditures in the lowest county, to 58.6 per cent of the total relief expenditures in the highest county. The cost of medical care in dollars per capita of total relief population ranged from \$1.35 in the lowest county, to \$10.43 in the highest county.

There is no justification for these wide differences. The counties where the cost of medical care represents an unreasonable percentage of total relief expenditures are the counties where one or more doctors have been uncoöperative and have taken unfair advantage of the medical relief program.

The Public Welfare Board and the county welfare boards would like to provide adequate and satisfactory medical care for all needy persons in the state. Under present conditions, the taxpayers of the state cannot finance an adequate program. We have in the past, and will continue to provide as good medical care as the finances of the state will permit. We have had the very finest coöperation from your committee on medical economics. We need and we seek the coöperation and friendly help of every doctor in the state in meeting this difficult problem with limited funds.

Briefly this is the situation: A large percentage of our population is totally dependent upon the medical profession and the welfare organization for health and medical service. Funds to meet this need are definitely limited. The Public Welfare Board and the various county welfare boards are aware of the need for a sound medical relief program. If this program is to be realized, we must have the unselfish coöperation of every physician in the state. It is a challenge to the medical profession of North Dakota.

What the General Practitioner Should Know About Insanity

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INSANITY has been defined as a prolonged departure from the individual's normal reactions of living, thinking and acting, and has also been called the result of a failure of adjustment of the individual to his environment. The environment is the situation in which the patient is found, which obviously differs with times and places. How the individual meets various demands and adjusts or fails to adjust to them, determines what is called his sanity or insanity. This adjustment is a gradual affair from infancy to old age, the young child having few adjustment problems and the mature person having many.

The unborn child has no conscious wants. The instant he is born, however, he begins to have to do some things for himself, instinctively starting to breathe and nurse. But still, the problems are very minor, and very little adjustment is demanded. As the child grows older, he must ask for a drink of water when he feels something that experience has taught him is thirst, or for food when he feels something that experience tells him is hunger. The mind at this time works in a thirsty-drink and a hungry-eat manner. Still later, the individual finds that the idea changes to a hunger-work-money-purchase-prepare-eat idea. It is the matter of how well the indi-

vidual responds and adjusts to these desire-effort-satisfaction demands of society that determines his normalcy.

There are certain desires that cannot be gratified, and it is the reaction of the individual to the thwarted desire that influences the normalcy of the individual. In any person the reaction to a thwarted desire will be one of three things: He will (1) forget it entirely; (2) substitute something else for that desire; or (3) enter into a little world of his own, becoming obsessed with the idea that he *has* satisfied that desire. Adjustment, either by ignoring or forgetting, or by a substitute desire is normalcy; and inability to adjust to the disappointment of one's environment, the abnormal or insane. Practically every case of insanity will be found to have some basis of similarity to this formula. Whether it be due to injury, toxin, drug, disease, degeneration or congenital weakness, it is an inability to cope with the environmental situation that constitutes insanity.

Everyone suffers disappointments and experiences thwarted desires. What elements then, determine whether one shall be able to cope with these disappointments satisfactorily, or develop an insanity? Two elements enter into this determination: (1) the predisposing and (2) the exciting factors. Predisposing factors are chiefly, heredity and such elements as the different epochs of life, such as puberty, marriage, involution and senility. One might compare a person to a piece of wood to be carved by a whittler's knife. Some woods are naturally soft and respond well to carving. Others are normally hard to carve, but when softened by some process, lend themselves well to carving. Heredity determines what type of wood the individual is, and the physiological epochs of life may constitute a softening treatment that renders the hard wood more easy prey upon which the exciting causes work.

The actual exciting causes for insanity may be either physical or mental insults to the system. Physical insults are such things as toxins or poisons, which may arise from within the body or from ingested drugs or poisons. Other physical insults include injuries and diseases. Mental insults are such things as sudden severe problems. Heredity does not, in itself, have as great an influence on the production of an insanity in a given individual as might be supposed, nor as great as has been formerly believed. True, an heredity well sprinkled with insanity is more apt to produce an individual who is more easily unbalanced in an attempted adjustment to life and the environment, but this is not necessarily so. It is enough to say that certain hereditary characteristics, and predisposing weaknesses may make the individual sufficiently impressionable so that social and environmental adjustments are too hard to make and insanity results. Also, unless there *are* some predisposing weaknesses of the mentality due to heredity or some other weakness, few of the exciting causes alone are sufficiently strong or damaging to produce an insanity.

All symptoms of insanity are due to a derangement of the normal psychic or thinking reflex action. A reflex is the reception of a stimulus, the handling of that stimulus in the central nervous system, and resultant action. A reflex action may be either mental or physical. A

simple physical reflex action is the knee jerk. A mental reflex is similar except that the stimulation, whatever it be, is carried up to a higher level of the nervous system, the consciousness, where the mental reaction results in a definite thought or action. Normally this thought or action will always be the same in the same individual from the same stimulation. It is other accompanying stimulations that enter with it that appear to give varied reactions. When, however, a derangement of the mental faculties exists, odd mental reactions develop from these stimulations. Such disordered thought-actions and thought-reactions produce symptoms of insanity.

Disorders of perception mean there is some fault in the *reception* of a stimulus. These constitute the various types of illusions and hallucinations. An illusion is an improper interpretation of an actually seen object. An hallucination is the reception of a stimulus that never occurred. For the purpose of this discussion, illusions will be separated from hallucinations only from a point of academic interest, and hereafter both phenomena will be considered as hallucinations. Hallucinations are of different forms, referable to and classified by their origin from one of the senses. Thus, auditory hallucinations are voices or sounds heard by the patient when, in fact, no sounds were actually made. Visual hallucinations consist of seeing things that did not exist in fact. Hallucinations of smell, taste and feeling give rise to their respective false beliefs of the patient.

The dream states border very nearly on true hallucinations in that one imagines seeing, hearing and perceiving things that do not exist. Clouding of the consciousness is also a form of hallucination, because, whether it be a mild clouding or a deep coma, the condition is an improper perception of the environment. Also into this class of improper perception is disorientation, whether it be disorientation of person, disorientation of time, or spatial disorientation. Hallucinations in general are the appearance to the individual of something which he has successfully repressed or covered up prior to a weakening of his consciousness. They may represent sexual desires, or the covering up of an inferiority by clothing himself in power. They may be either pleasant or unpleasant, and their true meaning is found only in psychoanalysis. The psychopathic dream states, disorientations and cloudings of consciousness are all very probably mild hallucinations, and probably represent the exclusion of or getting away from some unpleasant or intolerable situation or circumstance.

Hallucinations are disorders of ideas due to a faulty perception. There are other disorders of the content of thought due to stimulation, arising from within the mind itself. These are such things as delusions, fixed ideas, obsessions and the like. False beliefs need not necessarily be delusions, but perfectly normal deductions from false bases. Examples of false beliefs which are not hallucinations are such things as believing it to be a Monday because the washing is seen on the line. So again, the difference between a false idea and a true delusion is that there are supporting facts to prove the false idea, while a delusion needs no supporting facts whatever. A delusion may be fixed or change-

able, systematized or unsystematized. A fixed delusion is one that the patient adheres to constantly, while the changeable delusion is rapidly and quickly replaced by others. A systematized delusion is one in which the individual believes something false, not supported by any facts, and as a result of which he acts, coloring his life by his delusion. Delusions, too, are frequently defense reactions to avoid unpleasantness. Fixed ideas and obsessions are mild delusions, and may be found in otherwise perfectly normal persons as well as in the insane. A fixed idea is one firmly planted on the consciousness, which may or may not be entirely erroneous. The thing that makes it a fixed idea is the fact that the person governs his life by the idea.

An obsession is frequently accepted as and known to be false, and yet the subject is unable to act uninfluenced by his obsession. With an obsession, a person cannot rest until he has yielded to it, after which time he is comfortable and satisfied. Phobias are forms of obsessions that are pathological. Common ones are the fears or phobias of being in a narrow closed place, being in crowds, being alone, and so forth. In themselves the phobias are not very important symptoms, but when associated with others they may indicate a failure of adjustment.

These disorders of perception, called various forms of hallucinations, and the disorders of thought content, called delusions, are single thought disorders. They may start a chain or train of thought it is true, but in themselves, they are really single, individual and more or less isolated thought entities. They may color the train of thoughts, but in themselves do not alter the *course* of thinking. Normal thinking progresses in a direct line to a definite goal. Even a person suffering from hallucinations and delusions may have a normal *process* of thinking. Normal thought, then, progresses toward a definite goal and all other thoughts and ideas fall into a proper position until the goal is attained. One disorder of the train of thought is called flight of ideas. In flight of ideas, there is no goal at all, or, if there ever was one, the train never arrives. The ideas are connected phonetically, or in the mind of the patient. Some sound of a word used in a statement he makes will remind him of another thing, and he jumps to a statement about that. The disconnected thought is as apt to be used as the connected. It is due to the extreme distractibility of the patient that this is so. Frequently an idea from outside the mind of the patient may distract him.

Circumstantiality appears similar to flight of ideas, but differs in the very important detail that the patient will eventually arrive at his goal. There is a definite relationship between the thoughts stated, but the patient is unable to differentiate between the important primary ideas and the secondary ideas, and so includes them all.

Retardation of the train of thought or difficulty of thinking is a limitation of the patient's stock of ideas. He will, if given enough time and encouragement, eventually arrive at the goal. More severe retardation is a complete paralysis of thinking, a total loss of all thought. If there be any response to a question or command at all,

it may be nothing more than a repetition of the words just spoken to him.

These phenomena usually have a meaning. In the flight of ideas and the circumstantiality, the patient has some idea which he wants to hide. In the retardation and paralysis, the defense mechanism has failed, and the subject retreats into slowness or silence.

Disorders of feeling are also disorders of the thought content, but of those special thoughts called emotions. Exaltation is a feeling of elation not warranted by the environment. Depression is an unwarranted unhappiness, dejection or melancholia. There may be a total loss or severe impairment of emotional feeling. Severe emotional impairment is usually found only in greatly deteriorated minds. Morbid anger, also an emotional instability, is found especially in the feeble-minded or mental defectives with mental deterioration. This condition is an insanity or psychosis superimposed on a feeble-mindedness. These patients frequently go about looking for something to get angry about. When encountered in one of the less feeble-minded, it becomes a very dangerous condition, for the patient is capable of some sustained thought and can lay plans for revenge. The excessive emotional expression is usually a matter of the person getting into the emotional state that his various hallucinations and delusions may have placed him, or where he feels he deserved to be. Absence of the emotions usually denotes that the patient is living in his imagination entirely where he is apart from everything else, and enjoying himself with no help from the world at all.

Amnesias or memory losses, which are severe forms of ordinary forgetfulness from which we all suffer to some extent, may be due to some toxic or traumatic injury to the brain structure itself. In such cases they are hardly symptoms of insanity. When not due to some insult to the brain tissue, however, they are usually an expression on the part of the person to forget some unpleasant experience. Paramnesias, or remembering things that never happened are just the opposite of forgetting. They are expressions of the same sort, the wish to remember something that they wish had happened.

Rather peculiar to one form of insanity, the paranoid state, is the disturbance of personality. The symptom is usually due to a system of delusions becoming so complex and organized as to demand a change or transformation of the personality to fit the environment. This may result in the patient's believing that he is some figure of history. Or he may cease in his own belief to have any person at all. Occasionally, when more than one set of well systematized delusions occurs, several personalities are found in one person, and the one active at a given time will depend on which set of delusions is at the height at that particular time. There is usually a complete amnesia between the different personalities, no one remembering any of the acts or characteristics of the others. These are cases of dual or multiple personalities.

One more set of symptoms is rather important in that it refers to the effect of some of these mental symptoms on the motor volitional system. These are referred to as

disorders of action. Usually a mental excitement results in physical activity increase, and mental depression results in decreased physical activity. These may be reversed. Other disorders of action are the impulsions and compulsions. An impulsion is the uncontrollable desire to perform an act. Common examples are pyromaniacs, kleptomaniacs and dipsomaniacs. A compulsion is an urge to do something which the patient does not want to do, and frequently the act is very disgusting and abhorrent to him. In refusing to act when the compulsion develops, the patient suffers acutely.

Types of Insanity

Paranoia was formerly believed to be a form of insanity in which the patient was insane on one subject only. This is now known to be false, for the paranoid suffers from a general mental slowing and degeneration. The paranoid suffers from very definite and well systematized delusions. This definitely affects his judgment, especially in matters pertaining to his delusions. Paranoia usually follows a definite course of three stages. The condition may become arrested in any of the stages, and remain there for years. The stages may be reversed and the third stage may occur very early. The first stage usually begins in childhood, although it may not be recognized at that time. These patients are said to have been queer, taciturn, morose, avoiding other children and associating with older persons. The patient begins to feel that people are acting differently toward him. Older patients at this stage frequently complain that they fear they are losing their minds or their health. This gradually progresses into the second stage, ushered in by delusions of persecution and corresponding hallucinations, especially of hearing. Up to this time the subject has suspected that people were cold and aloof to him, but now he knows it, and hears them saying unpleasant things about him. The voices are very apt to become vulgar and terrible, accusing him of crimes and sins. Other hallucinations substantiate this belief. People are poisoning his food, are trying to gas him or to injure him with electricity. He builds elaborate defenses against these dangers, sealing up all doors and windows, or setting his bed in saucers of water as insulation. After a time he begins to recognize the individual who persecutes him and instead of they who are persecuting him, it becomes he. When the patient changes his ideas from *them* to *him*, he becomes dangerous. At first he flees from his persecutors, then he defends himself, and finally he strikes in retaliation. Having retained some of his mental faculties he is able to reason to some extent, and so is very dangerous. This stage may last for years before giving way to the third stage, the stage of ideas of self-importance. He begins to see that being such an object of persecution, he must be someone of great import. At this stage, the dual personalities or alterations of person appear. With this stage comes a more pronounced mental deterioration and enfeeblement even to an ultimate complete loss of mentality.

Dementia praecox is a form of insanity in which there are delusions and hallucinations and various mental disorders. The mental deterioration shows to a marked

degree early in the disease, and the delusions are much more fleeting and changeable. Usually, *dementia praecox* is seen in younger persons, but this is not invariably so. Recently, the name *schizophrenia* has been suggested. This means splitting of the psyche, and refers to the fact that in these cases there are frequently two or more trains of thought traveling together simultaneously. In general, *dementia praecox* also has its beginning in childhood with some oddity being apparent. These patients usually have been dull, but may have been unusually bright. They are frequently shut-in types, having no one with whom they can talk over their problems. Some of the exciting factors of insanity come along and set them off into a recognizable psychosis. It is impossible to guess the subject's reactions and answers. A question may bring a totally unrelated answer, a command may bring an opposite action, or no action at all. All this is due to his twin or double train of thought. This also accounts for the incoherence of speech found so regularly in these cases, and to the emotional deterioration. There are three types of *dementia praecox*, but these types may overlap or combine to give apparently more types.

Pure *dementia praecox*, or *hebephrenia*, is one type. A very mild form is sometimes called the simplex type or abortive form. This is a very mild and stationary form in which the disease has not progressed far enough to be called real insanity when it becomes halted. The patient is able to lead a more or less normal existence except that he is greatly altered. It is from this class that hoboes, prostitutes, cranks, eccentrics and criminals develop. Being a bit more severe it would have been a true *hebephrenia* with the general symptoms as mentioned before.

Catatonia, or catatonic *dementia praecox* has the usual onset and general symptom syndrome plus catatonia. Catatonia is an irregular alteration of excitement and stupor. In stupor we find negativism and muscular tension. These findings may be mild or severe, varying from being scarcely noticeable to so severe that the patient lies perfectly quiet in bed, refusing to speak, ignoring the calls of nature, holding the saliva till it putrifies and responding, if at all, to a command by an opposite action. A muscular rigidity resists all efforts to change the position of the body parts, and provides grotesque facial expressions held for long periods at a time. The condition may express itself in a waxy condition of the muscles, and while the limbs are easily moved by the examiner, they remain in the final position for long periods, dropping only from exhaustion. Catatonic excitement is just the opposite of the stupor, being shown in constant talking, tossing in bed, walking, and becoming maniacal. Talk has no goal, and is often completely incoherent. The patients are very impulsive, follow their impulsions, and are unable to explain any reason for their violent acts.

The third form of *dementia praecox* is the paranoid form. This is a usual *dementia praecox* with considerable dementia and paranoid symptoms added. The paranoid symptoms differ from true paranoia in that the delusions are fleeting and changeable, and not well organized.

They are usually persecutory in nature, but the type of persecution will vary from day to day. Such patients do not try to explain to their associates the reasonableness of their delusions as do the true paranoids.

Cyclic Insanity. A very frequent and most unhappy form of insanity is the manic-depressive, circular or cyclic insanity. The chief symptom of this disease is the recurrence of periodic phases of exaltation or mania alternated with phases of depression or melancholia. Usually accompanying these abnormal states are either corresponding or reversed expressions of motor activity. This means that a patient may be quite maniacal in his thoughts but quite normal or even subnormal in his physical activity, or the converse. Usually, however, the physical state corresponds to the mental state, the patient being agitated when in a mania and quiet when depressed. Some patients do not exhibit an alternation, but have cycles of mania or excitement only, and others have only cycles of melancholia, either being interspersed with apparently quite normal intervals. It is the recurrence of symptoms in a definite cycle that gives the disease the name of cyclic insanity. The usual findings during a manic phase are a flight of ideas, emotional excitement and increased motor activity. Hallucinations and delusions may develop, and if they do, they are usually of a grandiose nature. The depression or melancholic phase is the exact opposite of the maniacal. It is characterized by difficulty of thinking, emotional depression and decreased motor activity. When normal or nearly so the patients have quite an insight into their condition, and will discuss it intelligently with their associates. This type of psychosis is explained on the basis that when excited the patient is trying to keep up with his problems and is, in his mind, doing so. When in a depression, the problems of adjustment have simply overwhelmed him with their multiplicity and magnitude.

The psychoses so far described are those in which there is no demonstrable physical change in the brain structure itself. They are pure psychoses, or alterations of thinking due to the inability of the patient to deal with the problems of environment and society. There are also insanities in which the mind would, perhaps, never have failed had it not been injured or diseased. Aside from actual injuries to the brain with actual loss of brain tissue, it may be due to scar formation, pressure atrophy of brain tissue due to tumors, abscess, meningitis, depressed skull fractures; or the injury may be the result of infection or toxin from within the body, or drugs. The manifestations are apt to vary, depending on the extent of the injury, the degree of toxicosis, the parts of the brain involved, and the thing causing the effect.

Paresis is the first of this type of insanity to be discussed. It was a well defined disease entity long before it was learned that it is invariably caused by syphilis. Synonymous with the term paresis was the name "general paralysis of the insane," because it is more than just a psychosis. Before death, the patient invariably develops quite typical motor as well as mental symptoms. While every case of paresis is syphilitic in origin, not every case of syphilis develops paresis, nor does every case of neuro-

syphilis have paresis. Locomotor ataxia, for example, is syphilis of the nerves of the spine, but not always is it found in a combination with insanity, and when it is so found, it is referred to as tabo-paresis. Early in the course of paresis, the only symptoms noticeable are a gradual deterioration of the intelligence, defects of judgment, memory loss and evidences of moral delinquencies. These things constitute the first stage of the disease. The second stage usually presents physical changes added to the mental changes noted before and in addition more pronounced mental defects. The physical things easily noted are muscular tremors especially of the muscles of speech. These cause a peculiar quality of tremulousness in speaking certain words and phrases. A progressive general muscular weakness follows. Frequently, the patient is subject to seizures similar to apoplexy or epilepsy, which usually last longer than an epileptic fit, and disappear more quickly than an apoplectic insult. They leave very little or no motor paralysis, but it is very likely that there will be a very marked mental deterioration noticed after the spell, and the patient does not recover from this mental paralysis. The new level of mentality becomes his normal plane, and a new seizure will sink the mentality to a new low level. Memory fails more and more as the disease progresses, and all the mental defects of the first stage become more pronounced. Delirium develops, emotions are lost, speech becomes difficult, but not yet entirely lost.

At this point in the disease, paresis usually follows one of four types, and little more than mention of them should serve to differentiate them. They are: (1) the demented, in which loss of mentality is the chief symptom; (2) the excited, in which there is terrific mental activity with expansive and grandiose ideas; (3) the agitated, in which there is a great deal of motor excitement and the patient must be constantly on the go; and (4) the depressed, in which one finds symptoms similar to those found in the depressed phase of a cyclic insanity, but with no alternation of the phases. It is usual that paretics are discovered in one of these four types of the second stage of their disease.

The third stage is the final curtain for the paretic. It is the final, eventual and complete breakdown of the mentality. The patient ceases to have any human reactions whatever, and exists like a vegetable, totally unable to care for himself in any manner, losing control of his sphincters, soiling himself and finally being unable even to feed himself. These things constitute the major and most easily recognized symptoms of paresis. The most constant and dependable are the speech difficulties and the positive Wassermann reaction in an insane person.

The *senile dementias* have one thing in common that allows grouping them together. That thing is that changes incident to age so lower the threshold of mental balance that complexes and conditions which have been previously handled or compensated satisfactorily, are now allowed to come to the surface, and so manifest themselves as psychoses. Involutional melancholias, various delusions, anxieties, and true senile dementias, with incident memory and judgment failures, egotism and

paranoid ideas are examples of this condition. Arteriosclerotic dementias are probably expressions similar to these, with the added insult of brain starvation and actual loss due to atrophy. To an appreciable extent, the psychosis will be manifested by and dependent upon the area of the brain altered by the sclerosis. One almost constant finding in all cases is an increasing forgetfulness for recent affairs and events, faces, names and places. This obtains in the arteriosclerotic types, chiefly, and accounts for the frequency with which this type gets lost when a very short distance from home, and indeed, even within the home itself.

The last group comprises the infection, exhaustion and *toxic types of insanity*. These, in addition to the deliria may simulate more or less any of the types discussed before; but in general, when the disease has been cured, the infection removed, the toxin eliminated, or the exhaustion corrected, the psychosis improves. It is just that the patient has a low threshold, and the waste products that have accumulated have weakened the defenses of the mentality allowing some of the problems that

have been compensated to decompensate. The patient gets out of adjustment with his environment until the body balance has been restored. Any of the symptoms expected in almost any of the other insanities mentioned may be found as well as some manifestations which are new and strange.

In conclusion, only the high-spots of the symptoms and signs of the common types of insanity have been discussed. There is, however, one thought which should be emphasized: The inability of persons to adjust themselves satisfactorily to their environment and problems, introduces a big field in preventive psychotherapy. Just as a weak rope will break when overloaded, so a mind breaks when it tries to carry a load too heavy for itself. Poorly adjusted individuals and those whose minds can be likened to weak ropes, should be helped to make a proper or a satisfactory adjustment not by demanding more from them than they can carry mentally, but by finding for them a field of endeavor where the problems will not be more severe and heavy than they can carry.

The Management of Abortion*

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THE management of a patient presenting symptoms of abortion is often difficult, always dangerous, occasionally disastrous. There is no subject in obstetrics about which such a divergence of opinion exists. Difficulty arises chiefly in diagnosis; danger lurks in the ever-present menace of infection and hemorrhage; and disaster comes when the patient's resistance is overcome.

When we look upon abortion as a major obstetric accident and treat it as such, we take the first step necessary in its successful management.

The second step is a recognition of the stage of the abortion with which we are dealing, and that is not easy. For the purpose of this discussion, I wish to consider three stages of abortion: (1) threatened; (2) in progress; (3) incomplete.

The management of a threatened abortion should begin when the obstetric patient first presents herself for pre-natal care, especially if she is a primipara. She must be told that in pregnancy pre-menstrual symptoms, bleeding, "spotting" or backache, with or without lower abdominal pain, are abnormal and must be reported promptly. When an abortion threatens, my procedure is as follows:

1. Put the patient at absolute rest in bed.
2. Apply ice bags to the lower abdomen.
3. Give morphine or codeine by hypodermic.
4. Avoid both vaginal and rectal examinations.

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5. Allow no enemas or laxatives.
6. Prescribe an easily assimilable, low-residue diet.
7. Start progestin therapy by intramuscular injection.
8. Begin wheat-germ oil therapy.

The following brief excerpts from the clinical records of patients so treated during 1937 will illustrate the results obtained:

No. 12885. Gravida 5, Para 1. Normal male infant delivered by low forceps in 1929. Therapeutic abortion was done for early pulmonary tuberculosis in 1931. She returned to the clinic in her third pregnancy in 1934 and aborted spontaneously in March, 1934, at $4\frac{1}{2}$ months' gestation. Her fourth pregnancy also terminated in a spontaneous abortion at 5 months in September, 1935, despite the fact that her treatment was as outlined earlier except that progestin and wheat-germ oil therapy were not used. She returned in her fifth pregnancy in April, 1937, with a history of her last menstrual period having occurred in March, 1937, and the estimated date of confinement was December 7, 1937. Backache and bloody discharge were the chief complaints. Treatment similar to the above was employed plus progestin and wheat-germ oil therapy. She was treated as a bed patient for 10 days, then gradually allowed greater activity, and in June, 1937, the progestin was discontinued but the wheat-germ oil was continued through August, 1937. She was delivered at term of a normal male infant on December 1, 1937.

No. 22847. Gravida 2, Para 0. Registered at the clinic in her first pregnancy in November, 1935, when

2 months pregnant. "Spotting" appeared late in February, 1936. Despite hospitalization, the symptoms of abortion increased and she aborted a normal male fetus of about 5 months' gestation and weighing 880 grams on March 8, 1936. Progesterin and wheat-germ oil therapy were not given. She returned to the clinic in August, 1937, in the third month of her second pregnancy, complaining of painful uterine contractions of one week's duration but there was no bleeding. The uterus was the size of a 3 months' pregnancy, painful contractions were present during examination and abortion seemed likely. Treatment consisted only of progesterin by intramuscular injection and wheat-germ oil capsules by mouth with limitation of the patient's activity but not absolute rest in bed. The progesterin was continued until October 1, 1937, and the wheat-germ oil until November 18, 1937. No unfavorable symptoms have been noted since September 3, 1937. Her estimated date of confinement was February 13, 1938.**

No. 16250. Gravida 4, Para 2. Normal male infant born after breech labor at term in her first pregnancy in 1929. Her second pregnancy resulted in the birth of a normal male infant at term in 1931. Her third pregnancy terminated in a spontaneous abortion at 3 months in 1935 and she was not seen in this pregnancy until she entered the hospital with a profuse hemorrhage and the abortion in progress. She registered for pre-natal care in her present and fourth pregnancy in September, 1937, with the uterus the size of a 4 months' pregnancy and her estimated date of confinement February 28, 1938. Her complaints were weakness, lower abdominal pain, backache and slight "spotting". She had a moderate secondary anemia. Treatment for threatened abortion, including progesterin and wheat-germ oil, was started. The progesterin was discontinued in October, 1937, but the wheat-germ oil was continued through December, 1937. Aside from a slight bloody discharge with a little backache November 7, 1937, she has been free from symptoms of abortion.

No. 22117. Gravida 1, Para 0. Married 7 years, no contraceptives, very anxious to have children. Registered at the clinic in June, 1937, with a history of last menstrual period having occurred in April, 1937, and her estimated date of confinement, January 27, 1938. Her chief complaints were pre-menstrual symptoms and slight blood-tinged vaginal discharge. She was started on wheat-germ oil therapy and was given intramuscular injections of progesterin at intervals through August, 1937. She was also instructed to rest in bed at the time her menses would ordinarily occur each month. She has been free from symptoms of abortion since September, 1937.

These four brief case reports, covering patients seen with symptoms of threatened abortion in 1937, are selected cases only in the sense that they have been carried to the stage of fetal viability. They serve to illustrate the effectiveness of this type of therapy. Six additional patients are being similarly treated. None has aborted as yet but further time is necessary before they can be considered out of danger from threatened abortion.

Two procedures in the management of these patients warrant brief discussion:

In general, I plead guilty to a very decided skepticism relative to the efficacy of hormone therapy. However, since progesterin therapy has been available I have been using it, at first, with considerable doubt due to previous failures with the old extract of corpus luteum but, of late, with a feeling that it is of definite value. Injections are given every other day during the stage of acute symptoms; later, the intervals between doses is lengthened. The rationale of such therapy is established by our knowledge of the importance of the corpus luteum, especially in early pregnancy. It is reasonable to suppose that augmenting the supply of progesterin in cases of threatened abortion may have a favorable effect in bringing about a proper hormone balance at this critical period.

Wheat-germ oil therapy is used empirically. Vitamin E has not been standardized, either as to units, dosage or indications. I have used it on the theory that some patients have a relative sterility, at least a "low fertility" and that it is this type of patient in whom abortion most frequently occurs.

There is no disagreement among us regarding the conservative treatment of threatened abortion, whether it be by the procedures I have outlined or others which, in individual hands, have proven effective. But when we consider the management of abortion, in progress or incomplete, there is not such a unanimity of opinion! We still find physicians "cleaning out the uterus" with the curette. If the so-called "cleaning out" of the uterus could be bacteriologically effective, there might be some excuse for this radical procedure; but in the light of cold facts (and I am not being facetious in thus referring to autopsy findings), there is absolutely no excuse for the use of the curette in a case of abortion. In abortion from any cause, the uterus should only be invaded for the control of hemorrhage. If we would but remember that one indication and adopt a conservative plan of treatment, the number of cases of sepsis following abortion would be fewer and the severity of the infections that did occur would be minimized.

Furthermore, we would be amazed at the infrequency with which we had to invade the uterus for that one indication, **THE CONTROL OF HEMORRHAGE**. To illustrate: During the 10-year period, 1927 to 1937, I treated 97 cases of abortion, in progress or incomplete. During the years 1927 to 1929, inclusive, the uterus was invaded 18 times in 39 cases; during the years 1930 to 1936, inclusive, the uterus was invaded 13 times in 58 cases. I have not changed my technique during this period when invasion of the uterus is necessary. The only change that has been made had been an improvement in the non-surgical treatment of such patients. When hemorrhage threatens to become alarming and non-surgical methods have failed, the patient is surgically prepared as for vaginal operation and under direct vision, the cervix is inspected. In most instances, some or all of the products of conception will be found protruding through or presenting at the os. In that case, the sterile gloved finger or a placenta forceps is

all that is used to remove it or to explore the uterus. A carefully and gently placed pack will control whatever bleeding may occur thereafter. The curette is a dangerous, a murderous instrument in such cases and should not be used.

Nature tries to be kind in cases of abortion by throwing out a protecting wall of leucocytes in and about the endometrium. All we do with a curette at such a time is to harrow the infection into the myometrium and beyond it. One of the tried and true methods to determine the activity of a pelvic infection after it had given clinical evidence of subsiding was to make a vigorous bimanual examination of the patient. If infection was still active, a rise in temperature, even a chill, was the result. You can obtain a similar clinical response, though more violent and not-infrequently fatal, by curettage of the uterus that harbors an abortion, either in progress or incomplete.

In this small series of 97 cases there were no deaths. Many of them were infected on admission to the hospital. Some were self-induced, others had been induced by abortionists and some were spontaneous, judging by all available facts. Aside from the medico-legal aspects of the question, such a classification is inconsequential in their surgical management. The one safe rule to follow is **TO REGARD ALL AS INFECTED and AVOID SURGICAL INTERFERENCE EXCEPT FOR THE CONTROL OF HEMORRHAGE.**

If we regard all cases of abortion in progress or of incomplete abortion as potentially or actually infected, their management becomes simplified. We find a striking similarity between their management and the management of acute pelvic inflammatory disease. Of basic importance are the following:

1. Put the patient at absolute rest in bed.
2. Control pain.
3. Control bleeding by oxytocic drugs if possible, if not, by vaginal tamponade.
4. Combat shock.
5. Have blood examination made.
6. Give supportive treatment when necessary. (a) 5 per cent dextrose in saline by phleboclysis, (b) 6 per cent solution of gum acacia, (c) blood transfusion.

Under this plan of treatment, the majority of the patients will complete their abortions spontaneously with a minimum amount of damage to themselves. But, if under such conservatism, evidence of infection increases, the following additional procedures are recommended:

1. Elevate the head of the bed on blocks.
2. Apply ice bags to the lower abdomen.
3. Continue supportive treatment.
4. Employ Elliott treatment.
5. Consider the use of sulfanilamide.
6. Combat anemia with small, frequent blood transfusions.
7. Invade the uterus **ONLY FOR THE CONTROL OF HEMORRHAGE**, and then
8. **DO NOT CURETTE.**

Two patients who were treated within three months of each other in 1936 illustrate what I mean by conservative management.

No. 10026 was brought to the hospital in shock on the morning of September 3, 1936. Slight vaginal bleeding had been present for ten days prior to admission. Her last menses had occurred in June, 1936. Following exertion on the morning of admission she had had a profuse hemorrhage, felt very weak and dizzy and complained of great thirst. On admission her blood pressure was 50/30, pulse 80 and very feeble, and her temperature was 97.8. A vaginal tampon was inserted and a 6 per cent solution of gum acacia in dextrose solution was started by phleboclysis. By evening she had rallied from shock. The following morning her blood pressure was 90/60, temperature 99.4, and pulse 100. She was taken to the operating room, surgically prepared, and the vaginal tampon was removed. With placenta forceps a mass of necrotic placental tissue was removed from the cervix and a merthiolate gauze pack was placed in the uterus. This was removed the following day and the patient was discharged on September 10, 1936. Her maximum temperature was 100.4 once on the afternoon of the day she was taken to surgery and it reached normal and remained there two days later.

There was no suspicion of criminal interference in this case and yet here was an infected abortion with hemorrhage, plus shock. Supportive and conservative treatment plus a minimum of surgical interference aided her recovery from a gravely serious condition.

No. 20744 was brought to the hospital in shock at 3:30 A. M. December 18, 1936. She was having a profuse vaginal hemorrhage. A signed statement to the effect that she had consulted an abortionist several days previously was obtained. She passed a fetus of about 3 months' gestation, one large mass and several smaller masses of placental tissue. On admission her blood pressure was 86/48, temperature 97.4, pulse 92, hemoglobin 61 per cent (Sahli), red blood count 3,920,000, and white blood count 21,300. Vaginal tamponade was done and dextrose in normal saline was started by phleboclysis. After shock treatment had been effective she was taken to the operating room and after surgical preparation the vaginal tampon was removed. Fresh bleeding occurred. A mass of placental tissue was found protruding through the cervix and this was gently removed with placental forceps. The bleeding ceased immediately. A vaginal tampon was inserted and removed 24 hours later. Her temperature was 100 on December 19; 101, December 20; and it reached 104 on December 21. The lochia became dark and foul and there was marked bilateral lower abdominal tenderness. Elliott treatment was ordered when the temperature reached 104 and was given twice daily thereafter until December 27. Her temperature reached normal on December 25. On December 22 her hemoglobin was 48 per cent (Sahli), and a transfusion of 350 cc. of citrated blood was given. She was discharged on December 31, 1936, after 15 days of hospital treatment.

Here was an admittedly criminal abortion with hemorrhage plus shock. Again supportive and conservative treatment plus a minimum of surgical interference were successful in aiding recovery.

Both of these patients were infected abortions. They belong to that large group of patients in whom the presence of both infection and hemorrhage add greatly to the risk involved in their management. Conservatism never showed itself of greater value than in the treatment of such patients.

But is the abortion problem in North Dakota serious enough to warrant so much emphasis being placed on its conservative management? My answer is found in the vital statistics of the North Dakota State Department of Health. For 1936 the figures are as follows:

Total births in North Dakota for 1936	13,770
Total maternal deaths in N. Dak. for 1936	60
Total N. Dak. maternal deaths from abortion, 1936	11

Percentage of maternal deaths due to abortion, 1936	18%
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For the first 11 months of 1937 and under date of December 30, 1937, the North Dakota State Department of Health submitted these figures:

Total maternal deaths in North Dakota to Dec. 30, 1937	55
Total maternal deaths from abortion, same period	6
Percentage of maternal deaths due to abortion, same period	10%

Any cause of death which kills from 10 to 18 per cent of the women who die from obstetric causes in any state in any year is worthy of the earnest study of the medical profession of that state!

The average death certificate is woefully inadequate for statistical purposes when we attempt to determine the exact cause of a maternal death from it, but, even so, a summary of the 17 deaths reveals the following:

Septicemia following criminal abortion	6
Septicemia following spontaneous abortion	8
Air embolism, self-induced abortion	1

Myocarditis, surgical parotitis following therapeutic abortion	1
Cerebral embolism	1
Total	17

In the eight cases of septicemia following spontaneous abortion, curettage was acknowledged in three cases and it was done in the case of the cerebral embolism. Surely an operative procedure which was followed by death in 23 per cent of the patients upon whom it was employed cannot be credited with a high degree of efficiency! And when approximately 50 per cent of the deaths from abortion occurred in a group classified as spontaneous abortion and were attributed to septicemia, one would have to be more of an optimist than I to attempt a classification of abortion on the basis of infectious or non-infectious.

Conclusions

In conclusion, I must return to my original statement: That the management of a patient, presenting symptoms of abortion is often difficult, always dangerous, and occasionally disastrous.

One may properly classify them as (1) threatened; (2) in progress; and (3) incomplete. In all of them, a conservative plan of treatment should be followed. There is only one indication for the invasion of the uterus in abortion from any cause and that is for the control of hemorrhage. When we adopt a more conservative attitude in the management of abortions, when we discard the curette in such cases, and when we invoke a more careful statistical study of the causes of death in abortion and are self-critical if necessary in the process, then and only then may we expect to see a substantial reduction in the mortality figures in this grave obstetric accident.

** Since this report was written, Case No. 22847 was delivered of a normal male infant of eight months gestation on January 23, 1938. Case No. 16250 was delivered of a normal male infant on February 22, 1938, and Case No. 22117 was delivered of a normal male infant on January 11, 1938.

The Meaning of "Athletic Heart" Among University Athletes*

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ABOUT ten years ago, a non-fatal cardiac accident, happening to one of our athletes at the end of a two-mile race, awakened our interest in the effectiveness of our physical examination of athletes, insofar as this examination pertains to the heart.

The athlete mentioned above had been on the track team of a high school in a large city, and he had been a distance runner at the University of Missouri for three

years. Both in high school and at the university he was examined yearly with no cardiac abnormality being detected. These examinations consisted in outlining his heart borders by percussion, in listening to his heart before and after exercise, and the use of one of the standard cardiac function tests and a vital capacity test.

Suspecting that this was not a sufficient cardiac examination, and to determine its effectiveness, one hundred athletes in the major sports at the University of Missouri

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were examined. These men had been high school athletes and had yearly physical examinations while in high school and at the university.

Of the one hundred examined, six showed evidence of cardiac hypertrophy and in all six there was evidence of cardiac damage, while the remaining ninety-four showing no cardiac abnormalities, gave no evidence of cardiac hypertrophy.

As a certain amount of cardiac hypertrophy had been considered the natural result of long-continued, strenuous exercise, its absence in these athletes, with the exception of the six who had a cardiac explanation of their hypertrophy, seemed to us to have a striking significance.

For ten years we have followed groups of athletes showing a minimal amount of cardiac damage and a like group of normal controls through their four years of college sports, and we feel that the facts observed are of some interest, particularly in regard to the production of the so-called "athletic hypertrophy of the heart." We have tabulated the results of the observation of 57 athletes with cardiac damage and 57 controls.

Since the Seventeenth Century, the idea that long-continued bodily exertion of great degree was harmful to the circulatory apparatus has been prevalent in medical literature.

In the early days of modern medicine this idea was found in the works of Corvisart, Hope, Kreysig, and others. They spoke as if it were a proven fact that excessive exercise could produce disease of the heart.

The Nineteenth Century finds in German literature frequent mention of athletic hypertrophy of the heart, and in English literature in the writings of Peacock, Abutt, Da Costa, and others.

In recent literature we also find frequent evidence of medical research tending to prove that long-continued physical exertion produces an increase in the size of the heart.

At the same time we see a beginning protest against the term "athletic heart."

In 1925, Pratt and Bushnell, of Boston, called attention to the unsatisfactoriness of the proofs of physical exercise as a cause of cardiac hypertrophy.

In his book, *Heart Disease*, White devotes a page to the discussion of athletic hypertrophy, but states that final conclusions cannot be drawn from the data he possesses that there is such a thing as athletic hypertrophy.

H. L. Smith in the *Proceedings of the Mayo Clinic Staff Meetings* called "athletic heart" an unfortunate term.

As the chief interest in the athlete's heart seems to be whether or not it is hypertrophic, there is but slight evidence advanced beyond whether or not the physiological response of the heart to exercise was one of hypertrophy of the heart muscle.

As our preliminary investigation seemed to show that the undamaged heart did not hypertrophy with exercise, and that the slightly damaged heart usually did, we tried to find some method by which the heart size could be accurately measured. There is not a uniformity of

opinion in regard to how accurately this can be done. The heart being a three-dimensional organ, its size may be expressed as volume or as weight.

Bardeen has checked the relation between heart volume, transverse diameter and area by anatomical measurements in the cadaver, and he found that their interrelation was sufficiently constant to justify the use of transverse diameter and area as an index of heart volume.

For practical purposes, radiological measurements of the heart are limited to the transverse diameter and area of the frontal silhouette. Area involves, besides the experimental error in obtaining the heart outline, a further error in measuring it, and for this reason we prefer the transverse diameter as the index of the heart size. The volume of the heart varies directly with the cube of the transverse diameter so that quite small changes in transverse diameter correspond to considerable changes in volume. According to the size of the heart, an increase of 1 cm. in transverse diameter may correspond to an increase of between 50 cc. to 200 cc. in volume. For the heart of average size, an experimental error of 5 mm. in measuring transverse diameter corresponds to an error of 15 per cent in volume. Again, the relation of transverse diameter to volume is not a constant one, for it varies with the position of the heart in the chest. This variation in the lie of the heart is roughly neutralized if the transverse diameter is correlated with both body height and weight.

In the beginning of our investigation we used the teleroentgenographic method of obtaining the heart shadow for measurement, and we have continued to adhere to this method. While it is more expensive and more prone to exaggerate the size of the heart than the orthodiagraphic method, still we feel that it is less subject to the personal equation of the examiner, and in any event, for the sake of comparison with our early work, it was necessary to continue to use the teleroentgenographic method.

We felt that the transverse diameter of the heart could be accurately measured by X-ray, and that it was the most satisfactory and practical guide for estimating the size of the heart.

The left auricle may enlarge without affecting the transverse diameter, but we have adopted a special technique for estimating its size. Any increase in size of all of the three remaining chambers will result in an increase in the measurement of this diameter.

A definite decision as to whether or not a heart is enlarged can be made only if the transverse diameter is compared with some standard which will state what the diameter of the heart of an individual should be if that individual's heart were normal.

In 1919, Danzer suggested the use of a ratio between the cardiac and thoracic transverse measurements as a standard. According to this standard, a heart is normal in size when its transverse diameter approximates one-half the internal diameter of the thorax, and is enlarged when its transverse diameter exceeds fifty per cent of

the internal diameter of the thorax.

This work was supported by articles published by several other investigators, but none of these articles contained detailed data in support of the validity of this standard, and nowhere can we find a control study in which a group of normal individuals were examined, nor in our study of over three hundred athletes is there any striking relationship between the intrathoracic diameter and the cardiac transverse diameter.

In 1926, Hodges and Eyster, of the University of Wisconsin, published a most excellent work establishing the relationship of the transverse diameter of the heart to the height and weight of the body. In this they propound a formula that correlates the relationship of the transverse diameter of the heart with variables of height, weight and age, and show that this formula is capable of mathematical verification.

The fact that the transverse cardiac diameter in an individual free from cardiac disease bears a constant relationship to one or more body measurements that can be readily and accurately obtained, and that this relationship could be advantageously used to predict the probable transverse diameter of the heart in any given individual, even predicting in which individual the heart by lying transversely will increase the diameter of its shadow, and in which individual by hanging vertically will diminish the diameter of its shadow.

This prediction of the cardiac size and position in given individuals can be mathematically determined by the method of statistical analysis known as the correlation of a criterion (transverse diameter of the normal heart) with one or more variables (height, weight and age).

The fact that a heart of given size will show a narrow transverse diameter if suspended freely in a long narrow chest, or a wide diameter if pushed upward into a transverse position by an elevated diaphragm, cannot be accepted as compatible with the transverse measurement of the thorax. It is more compatible with the estimation of the height of the individual, but this is not nearly so accurately compatible an index as weight is to the transverse diameter. Age has but a small influence on the size of the heart.

Hodges and Eyster have applied their formula (the transverse diameter of the heart $= + 0.1094 \times \text{age} + 0.8179 \times \text{weight} - 0.1941 \times \text{height}$) to formulating a table from which one can predict the normal transverse diameter of the heart of the individual with an error of less than 5 mm. This table was used in predicting the normal transverse diameter of the heart in the athletes that we examined.

In the examination of the forty-nine athletes whose transverse diameter of the heart exceeded the predicted transverse diameter, and the eight who showed evidence of cardiac damage but did not give evidence of hypertrophy, as well as the fifty-seven controls, the following measurements and tests were used:

The kind of athletic sports engaged in while in high school and in the university was noted.

Their height and weight.

The transverse diameter of the thorax.

The transverse diameter of the heart shadow as shown in the teleroentgenogram.

The predicted transverse diameter as given for the individual's height, weight, and age, by the Hodges-Eyster formula.

A film taken of the position of the esophagus in the right oblique lateral position, to determine the size of the posterior chamber of the heart (left auricle) as shown by its indentation of the esophagus, and an antero-posterior film to show lateral displacement of the esophagus—the films being taken immediately after swallowing a mouthful of barium paste. We found that any enlargement of the left auricle first compresses and then displaces laterally to the right the esophagus. Any enlargement of the left ventricle of sufficient size to rotate the heart, displaces the esophagus laterally to the left.

The outline of the heart was obtained by percussion, and any hypertrophy shown by this method noted.

Any thrill palpated over the precordia was noted.

The presence of a murmur and its character and position in the cardiac cycle was noted.

The reading of an electrocardiogram was recorded.

Any other abnormal signs pertaining to the heart were noted, special attention being given to the first cardiac sound at the apex, and the second aortic sound at the second right interspace.

Each patient was put through a cardiac fatigue test, which is usually spoken of as a cardiac function test. The purpose of a cardiac function test is to produce cardiac fatigue and estimate how quickly the heart recovers from it.

Feeling that a definite exercise test of cardiac function does not produce the same amount of cardiac fatigue in all individuals, but that an exercise test should be devised that could be carried out to the extent of exercising each heart until it shows evidence of fatigue, and that this test be continued to the point of evidence of cardiac fatigue in each case, as the length of continuance of the test would probably be determined by the previous training to which the heart has been subjected.

After trying various methods of estimating cardiac fatigue, such as observing the respiratory rate, *etc.*, we adapted a device of bandaging the bowl of a large (5 cm. in diameter) Bowles' stethoscope with an extension of tubing making an over-all length of six feet, to the chest wall just within the apex beat, with ten feet of elastic bandage, and exercising the patient with the squatting sitting-up exercise until cardiac fatigue is produced, as evidenced by labored respirations through an open mouth and reddening of the face.

In using this method of observing cardiac response to exercise, the following phenomena were noted in the athletes with normally-functioning hearts:

There is no immediate rise in cardiac rate with the beginning of exercise, but after an interval of a few seconds the visible evidence of fatigue is noted to coincide with a sudden rise in the pulse rate to 120 or more

per minute and the sound coming through the stethoscope of rapid labored breathing.

The pulse rate increases suddenly to the rate mentioned, and there is no further increase while the exercise is maintained, although the breathing becomes more labored.

After the rate is held for ten seconds, the patient is allowed to rest. Immediately with the cessation of exertion there is another sudden elevation of pulse rate from the rate established during exercise to one about ten beats per minute faster. This rapidly drops after ten seconds and then more slowly, until after from sixty to eighty seconds the heart rate has returned to normal.

After the stopping of exercise, the deep rapid breathing at once tends to assume its normal rate and depth.

A heart that is damaged to the extent that its function is impaired responds differently to exercise.

There is no period of exercise before the heart responds to fatigue with a sudden rise of pulse rate; but the pulse gradually climbs to a rate higher than the normal heart, and the breath sounds become audible early.

On stopping the exercise, there is not the sudden increase in heart rate for several seconds, as noted above with a following drop, but the heart rate, already about twenty beats per minute faster during the exercise, has not reached the normal by one hundred and twenty seconds.

The respiratory rate which has been faster and more labored than in the normal heart does not drop to normal quickly on rest, but maintains a rapid and sometimes even a more rapid rate on rest, coming to normal often in thirty to sixty seconds (paradoxical pulse/respiration ratio of Messinger). This is a valuable test in ruling out unfit hearts among athletes.

Among the 114 tested, all responded normally both on entrance to the university and on their final examination four years later. One would expect a heart tuned-up by four years of high school athletics to show a normal response to any cardiac fatigue test. We observed our abnormal responses from cardiac cases among the non-athletic students and patients in the general out-patient clinic.

The vital capacity of the athletes was estimated in terms of cubic centimeter per square meter of body surface, as determined by the DuBois height and weight formula.

A careful history was taken of the patient's past cardiac experiences and of any evidence of cardiac embarrassment while in the university.

The tabulation of the results of the measurements and tests shows the following facts:

That more cases of hypertrophy were found among those training for track and basket ball than among other sports, and the fewest cases among the poloists and football players.

In every one of the forty-nine cases which showed hypertrophy, it was found that it had developed before entering the university, and that university athletic

training had increased this hypertrophy but little, and in many cases not any.

That in the eight cases of cardiac damage, found in entering athletes without hypertrophy, no hypertrophy was found after four years of university training.

No non-cardiac control showed any evidence of hypertrophy during four years of sports.

That there was no constant relationship between the greatest internal thoracic diameter and the transverse diameter of the heart.

That the esophagram gave early evidence of enlargement of the posterior chamber of the heart (left auricle).

Among the forty-nine cases showing hypertrophy as measured by transverse diameter, the esophageal shadow showed distortion in twenty-nine cases.

In nine cases, the esophagus was compressed from in front, the indentation outlining a large left auricle.

In eighteen cases, the esophagus was compressed and displaced laterally to the right by the auricle.

In two cases, both aortic lesions, the esophagus was displaced laterally to the left, due to the rotation of the heart by a large left ventricle.

Among the eight cardiac cases not showing hypertrophy, as measured by the transverse diameter, there was distortion of the esophagus in three cases.

Two cases showed compression, and one case showed compression and displacement to the right.

None of the non-cardiac controls showed any distortion of the esophageal shadow.

That of the forty-nine cardiac cases showing hypertrophy, in twelve, no murmurs could be heard in any position, or during or after exercise.

Of the eight cardiac cases not showing hypertrophy no murmur could be heard in one.

In three of the cardiac cases, in whom no murmur could be heard on entrance, a murmur was detected four years later.

In one case, the murmur heard on entrance was not heard at the examination four years later.

In four cases, the murmur (pre-systolic at apex) could be heard only in the left lateral prone position.

In eight cases, the murmur was brought out by exercise.

Of the forty-one murmurs attributed to lesions at the mitral valve, in twenty-three a pre-systolic murmur was heard. In six, a mild diastolic murmur was heard. In six, a systolic murmur alone was heard, and in six there was a double murmur.

Of the three murmurs attributed to lesions of the aortic valve, one was a systolic murmur in the second right interspace and transmitted into the neck. The other two were faint, distant, blowing, diastolic murmurs heard along the left border of the sternum, and were quite audible during exercise.

That none of the non-cardiac control cases showed the presence of murmurs during any of their examinations.

The tabulation also showed that of those with abnormal cardiac signs other than murmurs, of the fifty-

four hearts classified as having lesions of the mitral valve, in forty-six the first sound of the heart was accentuated.

All the hearts having a pre-systolic or mid-diastolic murmur had an accentuation of the first sound except one.

Of the thirteen hearts classified as having mitral lesions, but showing no murmurs, all had an accentuation of the first sound.

Of the six hearts that produced systolic murmurs at the apex, all had a diminished or absent first sound.

One of the hearts that had a double murmur at the apex also had a diminished first sound.

In the group with pre-systolic and mid-diastolic murmurs, the second sound of the heart was diminished in fourteen cases, and the pulmonic second sound was exaggerated in five cases.

Of the three hearts producing murmurs due to aortic lesions, one, in which a systolic murmur was heard in the second right interspace and transmitted to the neck, showed an absence of the aortic second sound. In the other two, the second sound was not noted as being abnormal.

That a thrill was palpated at the cardiac apex in thirty-two, all hearts with mitral lesions.

A thrill was palpated over the aortic cartilage in two hearts with aortic lesions.

That none of the non-cardiac control cases developed any abnormal cardiac signs.

That of the forty-nine cases showing cardiac hypertrophy, thirty-four gave evidence of hypertrophy on percussion.

Hypertrophy had to cause the transverse diameter to exceed that predicted by 1.5 cm., before percussion informed us that the heart was hypertrophic.

That in twenty-four cases the electrocardiogram showed abnormalities of conduction, evidence of muscle damage, or predominance of one of the ventricles.

In one case, fibrillation was noted at the time of the discharge examination.

That none of the non-cardiac control cases showed any change from the normal in their electrocardiograms.

That all the cardiac cases and non-cardiac controls responded normally to the fatigue test.

That in listening through the extension stethoscope during exercise, it was noted in addition to the usual response in heart rate and respiration, that cardiac murmurs would appear and then be lost immediately on rest. Also, murmurs already present would change their quality remarkably.

That the vital capacity test was normal in all cases.

That eleven cases gave a past history of cardiac abnormalities or rheumatic fever, or both.

Five cases gave evidence of cardiac distress while in training. In one case, that of a football player, this was very indefinite, but in the case of four track men, all distance runners, the history of distress after races, *i. e.*: cough, substernal pain, bloody sputum, vomiting, and blurring of vision, is very striking. All of these five cases had evidence of a distortion of the mitral valve.

A review of this data induces one to believe that in the home, in high school, and at the university, the hearts of students going into violent competitive sports have been given an insufficient examination.

In the examination of the heart, often an undue importance is attached to cardiac murmurs. The ability correctly to place extraneous sounds in their proper position in the cardiac cycle is desirable, but the examiner in so doing should also realize that no diagnosis of a cardiac abnormality is made by so doing.

Richard Cabot says "No diagnosis is satisfactory which rests on the evidence of murmurs alone."

From the complete absence of loud blowing murmurs among the several hundred athletes examined during this investigation, and the number of cardiac abnormalities found in which a murmur was difficult to detect, or was absent, it would lead one to believe that the average clinician still makes diagnoses of valvular heart disease solely upon the murmur heard.

Among the group of fifty-seven athletes tabulated a murmur was only faintly present or was absent.

The cardiac lesions were grouped about two valves—the mitral and the aortic.

The recognition of a murmur is of doubtful importance over the mitral valve area. The loud blowing systolic murmur heard at the apex and sometimes transmitted to the axilla and back is the commonest cardiac murmur heard, and makes mitral regurgitation the commonest diagnosis among the valvular defects.

This statement can be verified by the examination of the records of any large out-patient clinic. Yet, among 4,000 autopsies performed at the Massachusetts General Hospital, and reviewed by Doctor Cabot, only seven cases of pure mitral regurgitation were found.

Doctor Cabot in his chapter on "Mitral Regurgitation" in his book *Facts on the Heart* states: "The presence of a systolic murmur without other evidence of cardiac disease has been found to involve no functional weakening of the heart, no lessening of the athlete's powers, and no evil results either immediately after contests or in later years."

This murmur is almost entirely absent among the groups of athletes entering the University of Missouri during the last ten years, and yet this murmur is present in almost four per cent of the student body of the University of Missouri.

The conclusion must be reached that the family doctor and the school physician have zealously eliminated these individuals from athletic activities before they reach the university.

The other murmur heard at the mitral valve area is the diastolic or pre-systolic murmur heard sharply localized just within the apical impulse. This murmur is often heard in individuals with definite obstructive lesions at the mitral valve, but is overlooked in about one-half of the cases. (Fifty-five per cent in 180 autopsied cases—Cabot—*Facts on the Heart*). Also, the hyperthyroid or vagotonic individual can exhibit this murmur accompanied by a thrill and still have a normal heart.

The murmurs heard at the aortic area are much more definite in their meaning than those at the mitral valve area. Yet in Cabor's statistics there were twelve cases out of twenty-eight aortic lesions in which no murmur was heard during life.

The aortic lesions of this age group are nearly always the double lesions due to rheumatic fever. A history of acutely inflamed joints and fever is more often obtained than in mitral disease, which, although universally due to rheumatic fever, in this climate is rarely accompanied by a history of its usual manifestations.

Physical signs due to deformities of other valves were not noted in this series, and as they are very rare, do not form an important group of cardiac defects among athletes.

Methods of lessening the number of cardiac abnormalities overlooked by examining physicians must of necessity be somewhat more exacting than the listening to heart sounds before and after exercise, and the vital capacity test, or the exercise test as commonly used.

While it is obvious that the detection of cardiac murmurs is the chief resource of the examiner, faults of omission and commission are bound to occur, as many murmurs do not mean valvular incompetence, while many incompetent valves do not give rise to easily detectable murmurs.

The search for murmurs must not be neglected, as it is still our chief dependence in cardiac examination. It at least calls upon the examiner to explain their presence.

In examining the base of the heart, great attention must be given to the second right intercostal space. This should be searched for a rough systolic murmur transmitted to the great arteries of the neck and shoulder. This should be accompanied by a feeble or absent second sound, and have a downward transmission along the right border of the sternum to differentiate it from the murmur of aortitis, which, however, is rare at this age.

If a murmur just described is present, it should be accompanied by a palpable thrill.

If a thrill and weakened second sound are present, and no murmur is heard, it can often be brought out by exercise; if not, the examiner should still be suspicious of an obstructive lesion at the aortic valve, with a vibratory rate too low to be audible but which can be palpated.

As the lesion at this valve in this age group is nearly always a double one, and due to both obstruction and insufficiency, the left border of the sternum should be searched for the blowing diastolic murmur of aortic regurgitation. This may be very faint and distant, but can be brought out markedly by exercise.

These lesions at the aortic valve are more likely to be accompanied by hypertrophy, as hypertrophy of the left ventricle comes earlier. They also are supposed to constitute a more disabling circulatory defect than mitral lesions are, and athletes having aortic valve disabilities should be denied the more strenuous sports and be checked carefully during their college years. The degree of exercise should be determined by the transverse diam-

eter of the heart, as in aortic lesions the burden falls on the left ventricle.

The apex of the heart should also be carefully auscultated. Soft blowing systolic murmurs heard in this area, whether transmitted to axilla and back or not, put the burden on the examiner to prove that they are organic and denote a damaged heart. The systolic murmur which only very occasionally denotes mitral regurgitation should not place a limitation of the physical exertions of an athlete, unless accompanied by a thrill or a presystolic or a diastolic murmur, denoting some degree of stenosis, or there is evidence of an abnormal cardiac width, or unless it becomes very harsh or musical during exercise.

When in doubt, a teleroentgenogram should be made and the transverse diameter of the heart measured.

Also, as the left auricle bears the brunt of the burden in mitral lesions, an esophagram should be made and the size of the left auricle estimated.

An electrocardiogram should be made to prove the integrity of the heart muscle and conduction system.

The diastolic or presystolic murmur denoting mitral stenosis is often short and almost inaudible, but is always best heard in the prone or left lateral prone position. Even then it is sometimes absent, but can be heard during exercise. Occasionally it cannot be provoked because its vibratory rate is below the audible range, but the vibrations can be felt as a thrill.

The most common sign of mitral stenosis in our series was a loud ringing first cardiac sound, and in itself should put the examiner on his guard as to this possibility.

A certain per cent (59.26 per cent) of all the mitral lesions showed an enlarged left auricle with distortion of the esophageal shadow, and a certain per cent (37.04 per cent) showed some cardiac muscle or conduction damage or ventricular predominance.

The majority of cases will show an increase in the transverse diameter of the heart. The mitral lesions among athletes do not seem to place a great handicap on their activities, but due to the transitory breaks in compensation that we see in distance runners, I think the more violent sports should be denied them. The degree of exercise permissible in individuals with mitral lesions can be gauged by the degree of compression and displacement of the esophagus as shown in an esophagram, as this denotes the extent of the burden placed upon the left auricle.

In both aortic and mitral lesions the evidence of marked myocardial or conduction damage, as shown in an electrocardiogram should limit the student's exercise.

In conclusion, I wish to say:

That the cardiac examination, in this age group, based upon the recognition of a murmur, is faulty.

That considerable hypertrophy can take place before it can be detected by percussion.

That the usually-employed fatigue and vital capacity tests are meaningless in athletes of this age group.

The measurement of the transverse diameter of the heart by teleroentgenogram or orthodiagram, and its

SYNOPSIS OF CLINIC RECORDS OF FIFTY-SEVEN ATHLETES WITH CARDIAC LESIONS

Upper line—Examination on entrance to University.

Lower line—Examination four years later.

Case	Sport	Height Inches	Weight Pounds	Width Thorax, cm.	Trans Cardiac Measur., cm.	Hypertrophy cm.	Position of Esophagus in Esophagram	Murmurs	Other Abnormal Heart Signs	Hypertrophy by percussion	E. K. G.	Fatigue Test	Vital Capacity	History and Symptoms
T.M.Mc 1.	Bsk. ball Golf	71	141½	29 0	15 2	+3 62	Compressed and displaced to rt.	Presystolic at apex	Thrill at apex C1+++ C20 P20	Yes	Normal	Normal	Normal	Murmur after Ty- phoid 9 yrs. ago.
		71	145	29 0	15 5		No change	No change	Same	Yes	Normal	Normal	Normal	
D.J. 2.	Bsk. ball Polo	62½	130	27 0	13 8	+2 38	Normal	Rolling mid dias- tolic at apex	Thrill at apex C1++ C2- P20	Yes	Conduction system damage	Normal	Normal	None
		62¾	133	27¼	14		Normal	Presystolic at apex	Same	Yes	Same	Normal	Normal	
E.M.M. 3.	Track Tennis	68	151	32 5	14 5	+2 48	Compressed and displaced to rt.	None	Thrill at apex C1+C20 P20	Yes	Normal	Normal	Normal	None
		68	150¾	32 5	14 5		Same	None	Same	Yes	Normal	Normal	Normal	
D.G.B. 4.	Bsk. ball	68½	156½	29 0	14 8	+2 59	Compressed	Presystolic at apex. Systolic blow at apex during exercise	Thrill at apex C1++ C20 P20	Yes	Normal	Normal	Normal	None
		68½	155	29 0	14 6		Same	Same	Same	No	Normal	Normal	Normal	
V.T. 5	Bsk. ball Track	63½	143	25 7	14 0	+2 26	Compressed Displaced to rt.	Systolic blow dur- ing exercise only	C1+++ C2- P20	Yes	Normal	Normal	Normal	None
		63½	146	25 8	14 2		Same	Blow becomes mus- ical during exercise	Same	Yes	Normal	Normal	Normal	
F.T. 6.	Track	69	148	31 0	13 5	+2 05	Normal	Presystolic rumble in left lateral prone position at apex	C1+++ C20 P20	Yes	Normal	Normal	Normal	None
		69	148	31 0	14 0		Normal	Same— also during exercise	Same	Yes	Normal	Normal	Normal	
N.H.H. 7.	Baseball	66	152	27 0	14 0	+1 84	Normal	None	C1+++ C2- P20	Yes	Normal	Normal	Normal	Rheumatic fever 2 yrs. ago. Brother had it at same time and suffered severe car- diac damage.
		66½	158	27 0	14 0		Normal	Presystolic rumble at apex	Same	Yes	Normal	Normal	Normal	
J.C.T. 8	Football	71	182	30 0	15 2		Normal	Presystolic rumble at apex	Thrill at apex C1+++ C20 P20	Yes	Normal	Normal	Normal	None
		71	179	30 0	15	+2 12	Compressed	Same	Same	Yes	Normal	Normal	Normal	
K.W.F. 9.	Tennis	69	145	30 0	14 8	+3 22	Normal	Presystolic at apex	Thrill at apex C1+ C20 P20	Yes	Normal	Normal	Normal	None
		69	145	30 0	15 0		Normal	Same	Same	Yes	Normal	Normal	Normal	
J.W. 10	Baseball	69	158½	32 0	14 5	+3 22	Normal	Mid diastolic rumble at apex, left lateral prone position	Thrill at apex C1+++ C2- P20	No	Normal	Normal	Normal	None
		69½	159	32 0	14 3		Normal	During exercise mur- mur becomes musical	Same	Yes	Normal	Normal	Normal	
J.J.P. 11.	Track	67	142	27 0	14 0		Displaced to rt.	None	C1++ C20 P20	Yes	Right ventricular predominance	Normal	Normal	None
		67	148	27 0	14 0	+2 82	Compression and rt. lateral displacement	None	Same	Yes	Same	Normal	Normal	
D.V.B. 12	Football	70	189	32 5	15 5	+2 44	Normal	Presystolic at apex	Thrill at apex C1+++ C20 P20	Yes	Definite suggestion of delay between S.A. and V.A. nodes	Normal	Normal	None
		70	181½	32 5	15 8		Normal	Same	Same	Yes	Slight evidence of damage to conduc- tion pathways	Normal	Normal	
L.G.L. 13.	Bsk. ball	72	168	26 0	14	+1 67	Normal	Faint harsh systolic at apex	Thrill at apex C1+++ C2- P20	Yes	Some evidence myocardial damage shown in Lead III.	Normal	Normal	None
		72	168	26 0	14		Compression	Markedly increased during exercise	Same	Yes	Same	Normal	Normal	
F.M.McH. 14.	Tennis Polo	68	146	30 0	14 2	+2 50	Compression	None	C1++ C20 P20	Yes	Normal	Normal	Normal	Sent home from R.O.T.C. Camp on account "cardiac hypertrophy"
		68	146	30 0	14 5		Same	None	Same	Yes	Normal	Normal	Normal	
D.D.M. 15.	Tennis Golf	67	148	29 0	12 8	+1 54	Compression	None	Thrill at apex C1+ C20 - P20	No	Damage sinus node	Normal	Normal	Sent home from R.O.T.C. Camp on account "auricular fibrillation"
		67	147½	29 0	13 5		Compression and rt. lateral displacement	None	"extrasystole"	No	Same— No fibrillation	Normal	Normal	

SYNOPSIS OF CLINIC RECORDS OF FIFTY-SEVEN ATHLETES WITH CARDIAC LESIONS

Upper line—Examination on entrance to University.

Lower line—Examination four years later.

Case	Sport	Height Inches	Weight Pounds	Width Thorax, cm.	Trans. Cardiac Meas., cm.	Hypertrophy cm.	Position of Esophagus in Esophagram	Murmurs	Other Abnormal Heart Signs	Hypertrophy by percussion	E. K. G.	Fatigue Test	Vital Capacity	History and Symptoms
J. E. H. 16	Track	68½	150	27.0	12.8		Displaced to rt.	Rolling presystolic only heard in left lat. prone position	Thrill at apex C1++ C2- P20	No	Sinus arrhythmia	Normal	Normal	Two-mile runner. Complains of sub- sternal pain and blurring of vision while running.
		69	152	27.0	13.2	+1.21	Compression Rt. lat. displacement	Same	Same	No	Same	Normal	Normal	
M. R. L. 17	Football	71½	176	31	13.5		Compression and backward displ't	None	C1+++ C2- P20	No	Normal	Normal	Normal	Although in training complains that he is breathless on exer- tion.
		71½	180	31	14.7	+1.41	Same	None	C1+++ C2- P2+	No	Normal	Fatigues	Normal	
J. W. H. 18	Track	71	138	31	14.75	+3.31	Compressed	Mid diastolic at apex only in left lateral prone position	Thrill at apex C1+++ C2- P20	Yes	Normal	Normal	Normal	Developed a murmur after Scarlet fever at 2 yrs. of age. Mur- mur became less aud- ible as he grew older. Has not been recog- nized since he was 14 yrs. old. 1-mile run- ner at H.S. Distance runner at U. of Mo.
		71¾	145	31	14.75		Same	No murmur in any position. But it can be heard during exer- cise	Thrill increased C1+++ C2- P20	Yes	Normal	Normal	Normal	
R. J. H. 19	Bsk. ball	67	154	30	14.0	+2.91	Normal	Short scraping pre- systolic at apex	Thrill at apex C1+ C20 P20	Yes	Left ventricular predominance	Normal	Normal	None
		67	154	30	15.1		Normal	During exercise this displaces 1st sound	Same	Yes	Same	Normal	Normal	
E. S. 20	Swimm'g Tennis	70	152	29	14.75	+2.03	Compression and rt. lateral displacement	Soft blowing at apex	Thrill at apex C1 - C20 P20	Yes	Normal	Normal	Normal	None
		70	167	29	15.0		Same	Becomes musical during exercise	Same	Yes	Normal	Normal	Normal	
A. A. S. 21	Golf Tennis Polo	67	138	27.5	12.6	+1.07	Normal	Scraping Presystolic at apex	C1+++ C1- P20 Extrasystoles	No	Preventricular beats of nodal origin	Normal	Normal	None
		67	136¾	27.5	12.7		Normal	Same	Same	No	Same	Normal	Normal	
M. S. B. 22	Track	69	149	29.0	14.7	+2.05	Compression and rt. lateral displacement	None	C1+++ C20 P20	Yes	Right ventricular predominance	Normal	Normal	Rheumatic fever 1926. 1 yr. of rest on account of heart
		69	153	29.0	15.1		Same	None	Same	Yes	Same	Normal	Normal	
G. B. B. 23	Baseball	70	139	29.0	13.2	+2.06	Compression and rt. lateral displacement	None	C1+++ C2- P20	Yes	Normal	Normal	Normal	A murmur at apex was found at Clinic in 1929
		70½	142	29.0	13.7		Same	None	Same	Yes	Normal	Normal	Normal	
J. C. 24	Football	68	183	30.0	15.5	+2.51	Displaced to left	Faint distant blow- ing diastolic murmur over third left inter- space after exercise	Apex beat too demonstrative	Yes	Left ventricular predominance	Normal	Normal	None
		68	189	30.0	16.25		Same	Murmur very plain during exercise	Same	Yes	Same	Normal	Normal	
T. R. F. 25	Tennis Track	69	172	28.0	14.2	+1.74	Compressed and dis- placed to right	None	Thrill at apex C1+ C20 P20	No	Normal	Normal	Normal	None
		69	172	28.0	14.5		Same	None	Same	Yes	Normal	Normal	Normal	
J. W. M. 26	Bsk. ball	75½	146	29.0	14.25	+3.48	Compressed and dis- placed to right	Presystolic at apex after exercise	Thrill at apex C1+ C20 P20	Yes	Normal	Normal	Normal	None
		76	148	29.0	15.0		Same	Same	Same	Yes	Normal	Normal	Normal	
R. J. K. 27	Swimm'g Tennis	71	138	28.5	15.0	+4.40	Displaced to left	Faint diastolic heard at third l. interspace	Thrill over aortic cartilage. Apex beat too demonstrative	Yes	Left ventricular predominance	Normal	Normal	None
		71	142½	29.0	16.0		Same	Incr. dur'g exercise	Same	Yes	Same	Normal	Normal	
F. A. B. 28	Swimm'g Bsk. ball	69½	125	27.5	11.75	+0.60	Normal	Presystolic rumble at apex	Thrill at apex C1+ C20 P20	No	Conduction system damage	Normal	Normal	None
		69½	127¾	27.5	12.5		Normal	Same	Same	No	Same	Normal	Normal	
W. H. 29	Track	68¾	169	29.0	15.0	+3.04	Compressed	Faint presystolic rumble. On exercise faint systolic blow	Thrill at apex C1+++ C20 P2+	Yes	Normal	Normal	Normal	Cough after ¼-mile race
		69	168	29.0	15.72		Same	Murmurs become mu- sical after exercise	Same	Yes	Normal	Normal	Normal	During last year not so fatigued by races
C. B. 30	Golf Tennis Baseball	68½	149	31.5	14.0	+2.53	Normal	Short scraping pre- systolic at apex	C1+++ C2- P20	Yes	All leads normal Lead I Normal Lead II Fibrillation Lead III Fibrillation	Normal	Normal	None
		68½	147½	31.5	14.5		Normal	Same	Same	Yes		Normal	Normal	

SYNOPSIS OF CLINIC RECORDS OF FIFTY-SEVEN ATHLETES WITH CARDIAC LESIONS

Upper line—Examination on entrance to University.

Lower line—Examination four years later.

Case	Sport	Height Inches	Weight Pounds	Width Thorax, cm.	Trans. Cardiac Measur., cm.	Hypertrophy cm.	Position of Esophagus in Esophagram	Murmurs	Other Abnormal Heart Signs	Hypertrophy by percussion	E. K. G.	Fatigue Test	Vital Capacity	History and Symptoms
V.B. 31	Bsk.ball	70	127	28.5	12.5	+1.90	Normal	Soft blowing syst. at apex to axilla & back. Does not change during exercise. Probably functional	C10 C20 P20 Sinus arrhythmia Tachycardia	No	Normal	Normal	Normal	Marked vagotonic disturbances
		70	132	28.5	13.1		Normal	No murmur heard	Same	Yes	Normal	Normal	Normal	Some doubt about this being a cardiac case. Is much more stable
M.T. 32	Track	67½	153	29.5	14.0	+2.35	Normal	None	C1++ C20 P20	No	Normal	Normal	Normal	None
		67½	155	30.0	14.5		Compressed and displaced to right	None	Same	Yes	Normal	Normal	Normal	Dyspnea and cough at end of 2-mile race. Bloody sputum and vomiting at end of race
J.L.G. 33	Bsk.ball	73	155	29.0	14.8	+2.82	Normal	None	C1+ C20 P20	Yes	Normal	Normal	Normal	None
		73	157	29.0	15.0		Compression and rt. lateral displacement	None	Same	Yes	Normal	Normal	Normal	None
D.D.R. 34	Bsk.ball Baseball	62½	186	30.0	14.8	+1.35	Compressed	Presystolic rumble at apex	C1+ C20 P20 Thrill at apex	No	Normal	Normal	Normal	None
		62½	185½	30.0	15.0		Compression and rt. lateral displacement	Same	Same	No	Normal	Normal	Normal	None
V.L. 35	Baseball	68¾	142	30.0	15.0	+2.22	Normal	None	Thrill at apex C1+++ C20 P20	Yes	Lead I Normal Lead II Notched QRS T depressed Lead III Notched QRS. T diaphasic	Normal	Normal	None
		68¾	144	30.0	15.0		Normal	None	Same	Yes	Same	Normal	Normal	None
J.N.M. 36	Football	69	180	32.5	14.5	+1.75	Normal	Presystolic at apex. Rough systolic during exercise	Thrill at apex C1+++ C20 P20	No	Left ventricular predominance	Normal	Normal	None
		69	185	32.5	14.9		Normal	Same	Same	No	Same	Normal	Normal	None
L.M. 37	Tennis	64	140	26.0	11.8	+1.20	Compressed	None	Thrill at apex C1+++ C2- P20	No	Sinus arrhythmia	Normal	Normal	None
		64	140	26.5	13.0		Compression and rt. lateral displacement	Rolling presystolic at apex	Same	No	Normal	Normal	Normal	None
J.P.M. 38	Track Tennis Golf	69	142	30.5	15.35	+2.80	Compressed	Presystolic roll at apex	Thrill at apex C1+++ C2- P2+	Yes	Lead I Exaggerat'd T Lead II QRS notched Lead III P inverted T inverted	Normal	Normal	Was in bed 3 months when 8 yrs. old. acct. of heart. Activities limited 1 yr. 4 yrs. of tennis and track at Mil. Academy. Yearly examination with no findings
		69	140	30.5	15.5		Compression and right lateral displacement	Harsh systolic at apex shows up during exercise	Same	Yes	Same	Normal	Normal	None
R.D. 39	Track	65½	161	29.0	12.5	+1.26	Normal	Presystolic at apex. Soft systolic blow at apex not transmitted	Thrill at apex C1+ C20 P20	No	Normal	Normal	Normal	None
		65¾	160	29.2	13.75		Normal	Same	Same	No	Normal	Normal	Normal	None
J.R.B. 40	Football	75	196	30.8	15.1	+1.67	Normal	Rumbling presystolic at apex	Thrill at apex C1++ C20 P20	No	Normal	Normal	Normal	None
		75	195½	30.8	15.0		Normal	Same	Same	No	Normal	Normal	Normal	None
J.M. 41	Baseball Bsk.ball	68	147½	31.0	13.5	+1.60	Normal	Short presystolic roll at apex	C1+++ C20 P20	No	Normal	Normal	Normal	None
		68	150	31.0	13.4		Compressed	Same	Same	No	Normal	Normal	Normal	None
C.C.S. 42	Wres- tling	68	169	30.0	13.5	+0.70	Compressed	Rolling presystolic at apex	C1+++ C20 P20 Occasional extra-systole	No	T wave large in all leads. Marked sino-auricular block	Normal	Normal	None
			172	30.0	13.5		Same	Same	Same	No	Same	Normal	Normal	None
P.M. 43	Baseball Tennis	71	128	30.0	12.9	+1.81	Compressed	Short mid diastolic roll	Thrill C1+++ C20 P20	No	Normal	Normal	Normal	None
		71½	133	30.0	12.8		Compression and rt. lateral displacement	Same	Same	No	Normal	Normal	Normal	None
J.L.B. 44	Bsk.ball Track	70	160½	30.5	13.5	+1.2	Normal	None	Thrill C1+++ C20 P20	No	Normal	Normal	Normal	None
		70	159	30.5	13.8		Normal	Mid diastolic during exercise at apex	Same	No	Normal	Normal	Normal	None

SYNOPSIS OF CLINIC RECORDS OF FIFTY-SEVEN ATHLETES WITH CARDIAC LESIONS

Upper line—Examination on entrance to University.

Lower line—Examination four years later.

Case	Sport	Height Inches	Weight Pounds	Width Thorax, cm.	Trans. Cardiac Measur., cm.	Hypertrophy cm.	Position of Esophagus in Esophagram	Murmurs	Other Abnormal Heart Signs	Hypertrophy by percussion	E. K. G.	Fatigue Test	Vital Capacity	History and Symptoms
L.S.T. 45.	Football	69	172	31 0	13 8	+1.	Normal	Rumbling mid diastolic at apex—systolic at apex—blow during exercise	C1+++ C20 P2+	Yes	Left ventricular predominance Impaired A-V conduction	Normal	Normal	None
		69	178	31 0	14 0		Normal	Same	Same	Yes	Same	Normal	Normal	
T.V. 46.	Tennis Golf Track	66½	143	26 0	13 6	+2.92	Compressed Right lateral displacement	Soft blowing systolic at apex To A and B after exercise only	Thrill at apex C1+++ C2- P20	No	Normal	Normal	Normal	None
		66¾	135	26 0	14 0		Same	Harsher during exercise	Same	Yes	Normal	Normal	Normal	
M.B. 47.	Football	65	170	27 5	14 2	+1.62	Normal	Soft blowing systolic at apex. Not affected by exercise	Tachycardia C1- C20 P20	Yes	Normal	Normal	Normal	None
		65	170	27 5	14 5		Normal	Same	Normal rate	Yes	High T wave in all leads suggestive of myocardial damage	Normal	Normal	
M.C. 48.	Baseball	70½	168	30 0	13 5	+1.19	Normal	None	C1+++ C2- P20	No	T wave large in all leads. Short PR interval suggestive of hyperirritability	Normal	Normal	9 yrs. ago had "irregular pulse"
		70½	168½	30 0	13 8		Normal	None	Same	No	Same	Normal	Normal	
D.B. 49.	Baseball	68½	157	27 0	13 9	+1.69	Normal	Blowing systolic at apex after exercise	Thrill at apex C1+++ C20 P20	No	Definite suggestion of delayed conduction between A and V nodes	Normal	Normal	None
		68¾	159½	27 2	14 0		Normal	During exercise becomes musical	Same	Yes	Same	Normal	Normal	
R.E.L. 50.	Tennis	67	145	31 0	11 0	-0.87	Normal	None	Tachycardia C1+++ C20 P20	No	Sinus arrhythmia pronounced type	Normal	Normal	Vagotonia
		67	144½	31 0	11 0		Normal	None	Same	No	Same	Normal	Normal	
A.F. 51.	Bsk. ball	69	160	28 5	11.02	-1.34	Compressed	Rolling mid diastolic at apex	C1+++ C20 P20 Thrill at apex	No	Indication of delayed conduction from SA node to AV node. (0.22)	Normal	Normal	None
		69	161	28 5	11.02		Same	Same	Same	No	Same	Normal	Normal	
R.K. 52.	Tennis Golf Baseball	65	118	25 5	10 5	-0.06	Normal	Rolling presystolic at apex. Slight systolic blow at apex	C1- C20 P2+	No	Lead IS wave prominent. PR interval short. Lead II Normal. Lead III QRS high and upright	Normal	Normal	Rheumatic fever when 9 years old
		65½	120	25 5	11 0		Normal	Exercise changes systolic sound to intense harsh murmur	C1- C20 P2+	No	Same	Normal	Normal	
E.K.M. 53.	Track Golf	71	146	29 0	11 5	-0.35	Normal	Presystolic at apex	C1+++ C20 P20	No	Normal	Normal	Normal	None
		71	149½	29 0	11 5		Normal	Same	Same	No	Normal	Normal	Normal	
J.P. 54.	Track	66	139	25 0	11 0	-0.76	Compressed	Rolling presystolic at apex	Thrill C1+++ C20 P20	No	Normal	Normal	Normal	None
		66	141½	25 0	11 0		Compression and rt. lateral displacement	Same	Same	No	Slight evidence of myocardial damage difficulty in ventricular conduction	Normal	Normal	
C.W.P. 55.	Tennis Track	66	145	28 5	11 2	-0.36	Normal	Systolic over aortic area to neck and down right border of sternum	Thrill over aortic cartilage and carotids A2 — —	No	Normal	Normal	Normal	None
		67¾	148	28 5	11 6		Normal	Same	Same	No	Normal	Normal	Normal	
W.L.B. 56.	Bsk. ball Track	68	161	30 5	11 0	-0.98	Normal	Presystolic at apex Systolic blow at apex	Thrill at apex C1- C20 P20	No	Left ventricular preponderance	Normal	Normal	None
		68	163¾	30 5	11 5		Compressed	Same	Same	No	Same	Normal	Normal	
B.M. 57.	Tennis Track	63	123	25 8	10 2	-1.24	Normal	Blowing systolic at apex. Exaggerated by exercise	Thrill at apex C1- C20 P20	No	Sinus arrhythmia	Normal	Normal	History of cardiac murmur since childhood. Vagotonia
		63	125½	26 0	10 2		Normal	Same	Same	No	Same	Normal	Normal	

None of the students observed showed evidence of arterial hypertension.

comparison with the predicted transverse diameter as given in the Hodges-Eyster tables, an esophagram, and a properly interpreted electrocardiogram, are the three most exact methods of determining cardiac damage.

If these aids are not available to the examiner, or prohibitive on account of the cost, he can still train himself to recognize variations from the normal in heart sounds, to properly interpret loud blowing murmurs at the apex; and to be on the alert to catch the short presystolic murmurs, of a rumbling, rolling or scraping quality, not only in the standing but in the prone position, and oftentimes brought out clearly by exercise, and remembering that this same murmur occasionally appears under the same conditions in mid-diastole instead of the presystole.

The fact should be borne in mind that these obstructive mitral murmurs are nearly always followed by a loud ringing first sound of the heart, and that this abnormal cardiac sound is definite enough to arouse one's suspicion of mitral obstruction in the absence of a presystolic or mid-diastolic murmur.

He should also remember that murmurs can be felt as well as heard, and can even be felt when the vibratory rate is too low to produce a sound audible to the examiner.

That careful listening will allow him to recognize the faint, distant, echoing, blowing murmur along the left border of the sternum, produced by aortic regurgitation.

That a thrill at the aortic cartilage with an absent aortic second sound should arouse suspicion of an obstructive lesion at the aortic valve.

That evidence of damage to other cardiac valves is absent in our series and must be very rare.

That listening to the heart sounds during exercise and familiarizing oneself with the normal responses in pulse and respiration, while the heart is becoming fatigued, is very helpful, and we recommend the use of the extension stethoscope for this purpose.

We are convinced that abnormally large hearts among athletes are compensatory for cardiac abnormalities and that normal hearts do not hypertrophy because of college athletics.

With the greatest of care to weed them out, occasional cases of hypertrophy will be found in large groups of athletes.

We have just finished the taking of cardiac measurements on one hundred athletes to test our present methods of examination, which in group examinations still consists of listening to the heart before and during ex-

ercise. Suspicious cases then receive the complete examination, as shown in our tabulation.

The average for this group was only 0.6 cm. over the predicted diameter. If one allows 0.5 cm. for errors of prediction and a millimeter or so for teleroentgenographic exaggeration, this will be normal for the group.

However, when we have time to examine the hearts that exceed their predicted transverse diameter in this group, I feel sure we will find that we are still admitting to our teams, athletes with slight cardiac damage for which the heart muscle has to compensate by hypertrophy.

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American Board of Internal Medicine, Inc.

Written examinations for certification by the American Board of Internal Medicine will be held in various parts of the United States on Monday, October 17, 1938, and on Monday, February 20, 1939.

Formal application must be received by the Secretary before September 15, 1938, for the October 1938 examination, and on or before January 1 for the February 1939 examination.

Application forms may be obtained from William S. Middleton, M.D., Secretary-Treasurer, 1301 University Avenue, Madison, Wisconsin, U. S. A.

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HOW HONEST IS THE PROFESSION?

In the *Reader's Digest* of August, 1938, Dr. Richard C. Cabot is quoted as follows:

"We would never put a judge on the bench under conditions such that he might be influenced by pecuniary considerations. Suppose that if the judge were to hand down one decision he got \$5,000, and if he decided the other way he got nothing. But we allow the private practitioner to face this sort of temptation."

"The greatest single curse in medicine is the curse of unnecessary operations, and there would be fewer of them if the doctor got the same salary whether he operated or not."

"I am not accusing the medical profession of dishonesty, but I am saying that we should be defended from unfair temptation. I maintain that to have doctors working on salary would be better for doctors as well as for patients."

Since when has the medical profession become composed of men who remain honest only so long as no temptation is placed in their way? It is bad enough for laymen and cultists to accuse us of all the sins and vices that can beset man, but I think it is asking of us too much to meekly accept being rated by one of our own profession as commercially minded mechanics who are more interested in seeing how much money we can make rather than expecting a fair remuneration for good and honest services. What man or woman does not face temptation? No man can say that he is honest until

he has been tempted and not succumbed. The private practitioner is not perfect but I feel sure that the doctor who operates unnecessarily knowingly is the exception. If I am wrong, God help both the public and the doctor. Salaries would not cure the evil with which Dr. Cabot very serenely clothes the much abused private practitioner.

I doubt if the man who does not feel a pride in honestly practicing his profession would be a great boon to the public as a salaried employee. I think we all feel that some form of limited socialized medicine is necessary, but let us not fall for the fallacy of propaganda that preaches that the patient will be better cared for by the salaried man than by the one who gets just remuneration for individualized service.

R. E. J.

GOVERNMENT MEDICINE

For many years we have heard that government medicine was inevitable in this country. Theoretically it sounds good to many who know little of the practical side of the subject. Unfortunately there are men in our own profession whose names have become prominent because of some special position they have held or work they have done who express themselves freely in favor of this system of medical practice. A close study of these men will usually reveal the fact that they know little of the practical working of this system either

as to the cost to the government or service to the public.

During this era of depression and recession it is easy to stir up the public on matters of this sort. Only the unfavorable side of the present system of practice is presented to them. The comments of such men as Beverly Smith, in the *Reader's Digest*, the serial stories in *Liberty*, inspired by Macfadden and written by a doctor plainly not capable of speaking for the profession; the argument of Cronin in the *Citadel*, condemning physicians for not accepting a physicist as an authority in the highly specialized work of collapsing the lung, are given such wide publicity that the public cannot be blamed for their misapprehension of the real facts.

We cannot deny that there are such shortcomings in our profession, but in what profession or walk of life do we not find deficiencies? The great difficulty here is that these men have made "mountains out of mole hills" and have led the public to believe they are revealing something that has been a closely guarded secret. No profession or group of individuals has less to conceal than does ours, unless it is the confidence between the physician and the patient.

The small group of physicians who have taken it upon themselves to speak through the public press for the profession, unfortunately are mostly out of touch with the real practice of medicine.

They suggest that government controlled medicine would furnish more for preventive medicine, medical education, research, hospitals and diagnostic services. If they had made a careful study of the cost of medical care under government control, they perhaps would realize that not much would be left for extra service of any kind.

Dr. Scammon of the University of Minnesota, after a careful survey, estimated that government controlled medicine in Minnesota alone, in 1934, would have cost the state \$20,000,000, or one-half the entire state tax levy. He has shown further that the average family spends per year for luxuries, the following:

Motor car	\$150.00
Tobacco	67.00
Candy	37.00
Drinks and chewing gum	34.00
Radio and music	25.00

In comparison to these figures he has shown that the average family spends only \$24.00 a year for physician's fees.

The committee on the cost of medical care led the public to believe that the cost they suggested was for doctors alone. Analysis of these figures show that this cost included hospital, nursing and dental care and all other expenses encountered by the sick patient. The

physician received only 29.8 cents of each dollar included in their cost of medical care.

So far as better medical care under government control is concerned, it has been definitely shown that this is not true in the countries in which it has been tried.

Germany today has government control of medicine, yet their death rate is 12.3 per 1000 population; while at the same time in the United States the death rate is only 10.7 per 1000 population. Also it has been shown that 40 per cent of all money spent for medical care in Germany goes to politicians and other non-medical men, while only 60 per cent goes to the physician who must assume all responsibility for the care of the sick.

These few medical men who have taken it upon themselves to put out information in regard to the deficiencies of our present system fail to mention the fact that 125 million dollars is paid out annually to various healers other than physicians, and that 350 million dollars is paid out annually for patent medicines.

There is no reform suggested by any of these Medical Reform Committees that could not be included in our present system. How ridiculous does it seem when we consider the number of years a medical man must spend in learning his profession to have him and his profession controlled and dictated to by individuals, many of whom have had no education at all. This would be the situation under Government Controlled Medicine.

J. M. H.

MORE ABOUT LATIN

We have defended the use of Latin because of its exactness of meaning, so necessary in scientific dissertation; because of its universal understanding and interpretation throughout the educated world; and because it lends itself to the art of concealment where that may be considered desirable. Surely everyone will agree with the first two *because*s, but the third may be subject to criticism and calls for clarification.

Concealment, as here used, is not intended as synonymous with deception. We would not defend the practice of pedantic sorcery, but it is a well recognized fact that the majority of sick persons are highly apprehensive of unfavorable news whether it has to do with the prognosis in their individual cases or the misfortunes of their friends; and they should be shielded from the harmful effects of such knowledge. We therefore submit that there are instances where concealment of facts through the use of Latin may admirably serve to cushion the blows that would otherwise bring unnecessary hardship and desolation to these sensitive souls.

A. E. H.

Societies

SCIENTIFIC PROGRAM OF THE MINNEAPOLIS CLINICAL CLUB

Meeting of March 10, 1938

D. D. Turnacli, M.D., Presiding

A CASE OF DIABETES MELLITUS WITH INTERESTING COMPLICATIONS

A. E. CARDLE, M.D.

MINNEAPOLIS

This patient has been kind enough to come down with me this evening and I am presenting this case because it shows a number of interesting medical things in one case and I hope it will bring up a lot of discussion. Just how these things are related, I don't know, but I want to present them to you for your consideration.

This patient is 25 years old. At the age of 10, or 15 years ago, she found she had diabetes. The symptoms at that time were the usual symptoms of polyuria, polydipsia, polyphagia and loss of weight. She went to one of the local doctors in her town in 1923 and it was interesting to note that at that time she was placed upon a starvation diet and was told that she had only a year to live. You can well imagine that was true because that was the usual method of treatment at that time. However, living near Rochester, Minnesota, she went over to the Mayo Clinic where she was placed under the care of Dr. Wilder who prescribed the proper diet and insulin. She went on for a number of years quite successfully on that regime.

She came to me three years ago because she had a number of eye difficulties, the chief one being iritis. The diabetes was out of control and she had lost interest in the disease. She was again placed on the correct diet and the right amount of insulin but the iritis persisted, for which Dr. Camp saw her further. Between the two of us, we then attempted to take care of her. Upon her regime of insulin and diet, she immediately began to put on a lot of weight until she was quite fat and still gaining weight. I reduced the diet and tried to control the weight, placing her on a low calorie diet. At that time, I took a number of basal metabolism tests and also had her skull X-rayed because it appeared to me that she apparently must be having some glandular difficulty. The BMR ran from a plus 3 to a plus 14. That was hard to figure out. However, regardless of that fact, she was gaining so much weight that I placed her upon thyroid. At first I gave her a very small dose of thyroid and then increased the dose. She immediately began to feel better, her weight was controlled and she went along very nicely.

I might say that in this case menses did not start until the age of 18, and menses were irregular when I first saw her. The thyroid and the addition of antuitrin S controlled the menses. Following the iritis, she began to lose the vision in her eyes, so that she could not give herself the insulin; we then had a series of insulin shock, coma, insulin shock, etc. Dr. Camp took her tonsils out for the iritis. Last year she was on insulin and is now on protamine, with also 3 to 6 grs. of thyroid and we have her under very nice control.

Discussion

Dr. W. E. CAMP: I think Dr. Cardle outlined this case very clearly. I first saw her in 1931; she came in for the mild acute iritis in the left eye. She had no vitreous opacities and there was nothing to suggest anything severe about the iritis itself. This cleared up under atropine, rest and heat. Her vision, with a slight myopic correction, was normal in each eye. The fundus was also normal. She was seen in January, 1932, and refracted at that time and her vision with the correcting lenses, was perfectly normal. External examination of the eye was normal; funi were normal.

In March, 1933, she had acute iritis in the right eye; the iritis was muddy, vitreous clear, fundus normal, and this iritis cleared up under the application of heat and atropine. On April 9, 1934, she had a recurrent attack of iritis in the right eye

following a sore throat. In May of this same year she had a local tonsillectomy which was followed with no complications. In the latter part of May, she returned with a bilateral acute diabetic retinitis, edema of the disc, and surrounding retinal scattered deep hemorrhages and a few soft "cotton wool" exudates. These changes were more marked in the right eye than they were in the left. Her refraction at that time had changed from a very slight myopic correction to a very marked myopia. During June and July there was a gradual visual loss in the right eye and slight improvement in the vision in the left eye. During October and November of this same year the condition remained about the same. In December, 1934, the hemorrhage in the right eye was extremely great; it increased tremendously but in the left eye the hemorrhage was absorbed and vision was improved. In February, 1935, vitreous was almost completely filled with blood, the vision in the left eye was 3/200 which was very poor, and in the right eye there was practically no vision except light perception.

In March of 1935 the vision had greatly improved. At this time she took a plus lens correction. Previous examination showed a myopic correction. In March she began to develop a definite retinitis proliferans, and there was also in each eye a retinal detachment, more marked in the left eye than in the right. At the present time her vision is better in the right eye than in the left but is down to 3/200 in the right eye, and light and motion in the left eye.

I believe these attacks of iritis which we thought were on an infection basis were probably on a diabetic basis.

Dr. MALCOLM B. HANSON: This patient's sella turcica is extremely small and its size is definitely below the average. This sella turcica is also very round and its shape is seen more commonly in children. There is no evidence of erosion in the antero-posterior clinoid processes. This type of sella turcica is sometimes associated with a diabetes, particularly the insipidus type.

Dr. WALTER H. FINK: I would like to mention one or two points. I think this case is of interest chiefly because it is in a young person and has been watched while developing. It stresses to us the importance of ocular findings, not only in diagnosis but also in the prognosis of a case. I think most of us agree that perhaps three-fourths of the diabetic eye complications occur in the retinal vessels. These retinal hemorrhages undoubtedly are due to a friable condition of the retinal vessel which, ruptured, allow the hemorrhage to escape into the vitreous with scar formation. This will not develop in a normal person. It is possible we may have the same condition existing in the brain in a case of this type although it may not be causing symptoms.

Does the insulin treatment bear any relationship to the development of these numerous retinal changes? Does it have any relationship? Is it possible that insulin may bring about a more rapid development of vascular degeneration?

Dr. A. E. CARDLE: The interesting thing is, I think, that this is one of the youngest cases we have seen with this serious eye condition. We see them often in old people, but this is one of the youngest cases where these eye findings are present.

Dr. JAY DAVIS: I would like to ask Dr. Cardle what minimum dose of thyroid extract he found beneficial in this particular patient.

Dr. A. E. CARDLE: Gr. II of thyroid, daily.

SUBMUCOUS LIPOMA OF THE RECTUM

JAMES KERR ANDERSON, M.D., F.A.C.S.

MINNEAPOLIS

Abstract

Submucous lipoma of the rectum is quite rare.

Review of the literature.

Symptoms of lipoma of the rectum.

Diagnosis of the tumor.

Histology of the tumor.

Treatment of this tumor is accomplished by local removal without great risk.

Case seen and operated in December, 1937, reported in detail with illustrations.

(Complete paper will appear in a later issue of this publication.)

Discussion

Dr. WALTER FINK: "May I ask how you would explain embryonically the presence of fat in this area?"

Dr. J. K. ANDERSON: As far as I can find, there are fat cells deposited many places throughout the body and for some unknown reason they simply begin to grow. There is no other explanation that I can find. There are normally some fat cells in the submucosa.

TWO CASES OF HODGKINS DISEASE (Abdominal) COMPLICATED BY UREMIA

H. B. SWEETSER, JR., M.D.

MINNEAPOLIS

Hodgkins disease, or as the Cumulative Index terms it, lymphogranuloma, or as it is more commonly called here—one of the lymphoblastoma group—has been known for about one hundred years. In an extensive review of the literature in 1933, Wallhauser, in the Archives of Pathology, did not mention uremia as a complication. In 1936 Desjordin of the Mayo Clinic mentioned in passing, pressure on the ureter. In the same year Ginsberg in the Annals of Internal Medicine showed a picture of a kidney showing atrophy due to pressure of an enlarged gland. In 1937 in the Urological and Cutaneous Review there was a case report detailing involvement of one testis which the author considered rare. In the same year was an article in a French Journal mentioning diffuse renal invasion, and one other article by Lebovish in the *American Journal of Cancer*, who considered involvement of the bladder as unique. I could find no other mention of uremia as a complication of lymphogranulomatosis.

My first case is one from St. Barnabas Hospital seen by Dr. W. K. Foster in its terminal stage. This was a man of 77 years who had noticed enlargement of the inguinal glands a year before admission to the hospital. From January to April 1937 he lost 30 pounds in weight, and during April developed edema of legs, genitals and abdominal walls, . . . just before admission on April 18, obstipation, cramps and anuria. Examination revealed the edema, which was leathery and indurated. Over the chest and abdomen were small firm skin nodules which showed what was called leukemic infiltration on biopsy. No urine was obtained by repeated catheterization. The blood contained 6 per cent eosinophiles with a leucocyte count of 7,000. He died April 24th with the clinical picture of uremia. Autopsy showed lymphoblastoma (lymphosarcoma type) with generalized involvement of lymph nodes, liver, omentum, mesentery, ileum, appendix, sigmoid, rectum, bladder, ureters, diaphragm, pleura, right testis and skin. Microscopic examination showed also involvement of the thyroid. There was bilateral obstruction of the ureters with bilateral hydronephrosis and pyelitis and also compression of the pelvic veins by enlarged lymph nodes, with edema of legs, foreskin and abdominal walls.

My other case has been more interesting to me. This is a man of 67 years who had been in good health until last summer. Ten years ago he was found to have extra systoles and was told he would die of heart disease shortly if he worked. He retired and has lived happily since. He had sciatica years ago and arthritis of the lumbo spine and right hip joint. In August 1937 he returned from a motor trip east, with an infected toe. This cleared up in about ten days but his back and hip began to pain. I gave him one dose of arthritis vaccine in October and then a thrombo phlebitis developed in his right leg. A week later the same thing appeared in the left leg. With bed rest, the acute process disappeared but the swelling continued and extended up in his back and flanks. His urinary output diminished, so I gave him various diuretics, both of the caffeine and mercurial types. There was only a very mild effect from mercurin suppositories and none from the other diuretics. His edema continued although he became a little stronger.

In January 1938 his skin became very itchy, (Desjordin states that in his experience itching in lymphogranuloma indicates involvement of the abdominal nodes) and pain continued and increased in his right hip. About the end of January, we were able to feel several nodular masses deep in the abdomen with slight enlargement of the liver. Early in February his edema increased and urine decreased. On February 6 I gave him another mercurin suppository. From that day until February 10

he passed no urine whatever. His blood count showed 8 per cent eosinophils. Blood chemistry on this day was creatinin 4.1 mgm. per cent. With considerable hesitation, we made a diagnosis of abdominal Hodgkins disease with either pressure on the ureters and obstructive hydronephrosis and kidney failure, or pressure on the renal and pelvic veins in spite of the absence of enlargement of any superficial glands. My brother ruled out prostatic hypertrophy and was able to obtain no residual urine from the bladder. We then had Dr. Morse give him roentgen therapy. After four doses, one of which was over the right hip, the patient became worse. On February 10 he passed 50 cc. of urine and then none for three more days, making eight days with a total of some 60 cc. output. He became delirious and his creatinin went up to 7.5 mgm. per cent and the urea nitrogen to 99.6 mgm. His edema was very marked by now and had spread to the level of the nipples. There was a large amount of fluid in the pleural cavities and he appeared moribund. Suddenly then he changed and his output went to 300 cc. on the 14th, 1900 cc. on the 15th, and continued just under 3000 cc. His edema disappeared; his itching ceased; the pain left his hip and his mental state improved. He went home on February 22 well on the way to recovery.

During this week his condition has changed again. His output has gone down to around 1000 cc.; he has lost his appetite; he is beginning to look a little cachectic and I feel that his days are numbered. I rather hesitate to continue X-ray therapy. There is still a sense of resistance in the right side of his abdomen and I feel that the pathologic process is continuing in his retroperitoneal nodes.

While the diagnosis is not yet proven in this second case, I feel sure that these are two cases of uremia due to ureteral obstruction by a lymphogranuloma, the first immediately fatal, the second relieved, at least temporarily, by roentgen therapy.

Dr. RUSSELL W. MORSE: This film was made September 17th of last year, before the diagnosis of Hodgkin's disease was made. I want to illustrate the condition of this right hip which we felt at the time contributed to the pain which this individual had. Our diagnosis was a marked chronic osteoarthritis of the right hip. I do not believe that Dr. Sweetser felt it was related to the edema the patient had.

When I saw this man again on February 12th, he was in serious condition, and we decided to treat him anteriorly over the abdomen, taking in the kidney and the ureter regions with very small doses of radiation. It was impossible to do any cross-fire at all because the man would lie only in one position, and it was difficult to keep him in that position because of the pain he had. Three or four people had to be in attendance during the entire time. For three days he was given 95 r units anteriorly over the center of the abdomen, and a fourth treatment of 95 r units was given directly over the right hip. Then his condition became much worse, and treatment was discontinued. During the next week he got better, and before he left for home he was given three more treatments of 90 r units. The greatest possible amount of radiation he had was about 600 r units at 400,000 volts using 6 mms. of copper filter. It is unusual that a tanning of the skin developed from this amount of radiation. He had not had a great deal of radiation, and his response to the radiation which occurred after about 300 r units was quite surprising. I feel that if he is having a recurrence now of this obstruction, we could expect almost as much response to radiation.

Dr. ROBERT P. CARON: What were the abdominal findings after the swelling disappeared?

Dr. H. B. SWEETSER, JR.: I cannot feel any definite tumor; I cannot feel any kidney tumors. He had no more than 1 oz. of residual at any time.

Dr. ROBERT P. CARON: How soon after X-ray treatment would you expect an obstructive tumor to start melting down?

Dr. RUSSELL W. MORSE: With the doses being given, it would take six or seven days before you would notice much response.

Dr. E. R. ANDERSON: Hodgkin's disease manifests itself differently. In some cases the involvement is limited to lymph glands near the surface of the skin as in the cervical, axillary and inguinal regions. The mediastinal and retroperitoneal lymph structures may be the only site of the pathologic changes in others. In such cases the diagnosis will be obscured.

Future Meetings

Medical Association of Montana

The Scientific Meeting of the Medical Association of Montana will be held on September 5 and 6 at Lewistown, Montana.

The guest speakers will be Doctors Irving Abell, the President of the American Medical Association; R. W. McNealy, Arch E. O'Donohue, John R. Kleyla, R. G. Allison, and H. C. Hesseltone.

Central Association of Obstetricians and Gynecologists

The tenth annual meeting of the Central Association of Obstetricians and Gynecologists will be held October 6, 7, 8 at the Radisson Hotel, Minneapolis, Minnesota. Dr. J. C. Litzenberg, retiring head of the department of obstetrics and gynecology, University of Minnesota, will be the honored speaker. All physicians of the Northwest are invited to attend the meeting as guests.

International College of Surgeons

The Second National Assembly of the International College of Surgeons will be held in Philadelphia, Pennsylvania, with headquarters at the Bellevue Stratford Hotel on October 13 and 14, 1938.

All members of the medical profession of good standing are cordially invited to attend the Scientific program and various clinics. There will be no registration fee.

Manitoba Medical Association

The Manitoba Medical Association will hold its annual meeting at the Fort Garry Hotel, Winnipeg, September 22-24, 1938. All members of the medical profession on this side of the border are invited to attend. Clinics and demonstrations have been arranged at the teaching hospitals. Programs may be obtained from Secretary Dr. C. W. MacCharles, Medical Arts Building, Winnipeg, Manitoba.

American Public Health Association

The 67th annual meeting of the American Public Health Association will be held in Kansas City, Mo., October 25 to 28. More than 3000 professional public health workers are expected to attend. The program comprises fifty morning and afternoon meetings arranged by the ten sections of the Association which are: Health Officers, Laboratory, Vital Statistics, Public Health Engineering, Industrial Hygiene, Food and Nutrition, Child Hygiene, Public Health Education, Public Health Nursing, Epidemiology.

Special sessions are planned on Public Health Aspects of Medical Care, Oral Hygiene, Professional Education and Diphtheria Immunization. A public meeting under the auspices of the Local Committee is scheduled for Wednesday evening, October 26, with Dr. E. V. McCollum discussing "Milk Pasteurization" and Dr. Arthur T. McCormack "New Responsibilities of the Health Officer."

American Association for the Study of Goiter

The annual meeting of the American Association for the Study of Goiter will be held in Washington, D. C., September 12, 13 and 14 in conjunction with the Third International Goiter Conference.

Railway Surgeons

The 23rd annual meeting of the American Association of Railway Surgeons will be held at the Palmer House, Chicago, September 19-23, 1938. An interesting program has been arranged and all physicians and surgeons are invited to attend the sessions of this meeting as guests of the organization.

PROGRAM INTERNATIONAL ASSEMBLY INTER-STATE POSTGRADUATE MEDICAL ASSOCIATION OF NORTH AMERICA Philadelphia, Pennsylvania October 31, November 1, 2, 3, 4, 1938

MONDAY, OCT. 31 — A. M.

Diagnostic Clinic: "Acute Coronary Occlusions"—Dr. G. Harlan Wells, professor and head of the department of medicine, Hahnemann Medical College and Hospital of Philadelphia, Pennsylvania.

Diagnostic Clinic: "The Significance of Low Back Pain"—Drs. Frank R. Ober, assistant dean, and John B. and Buckminster Brown, clinical professor of orthopedic surgery, Harvard University Medical School, Boston, Massachusetts; professor of orthopedic surgery, University of Vermont Medical School, Burlington, Vermont.

Diagnostic Clinic: "Present Status of the Treatment of Hirschsprung's Disease"—Dr. Fred Rankin, Lexington, Kentucky.

Diagnostic Clinic: "Hydronephrosis"—Dr. Herman L. Kretschmer, clinical professor of surgery (genito-urinary), Rush Medical College, University of Chicago, Chicago, Illinois.

Diagnostic Clinic: "The Significance of Jaundice"—Dr. Henry A. Christian, Hersey professor of the theory and practice of physic, Harvard University Medical School, Boston, Massachusetts.

MONDAY P. M.

Chalk Talk: "Trauma of the Larynx"—Dr. Chevalier Jackson, professor of bronchoscopy and esophagoscopy, Temple University School of Medicine, Philadelphia, Pennsylvania.

Diagnostic Clinic: "Postoperative Complications"—Dr. Elliott C. Cutler, Moseley professor of surgery, Harvard University Medical School, Boston, Massachusetts.

Diagnostic Clinic: "The Treatment of Anemia"—Dr. Russell L. Haden, Cleveland Clinic, Cleveland, Ohio.

Address: "Practical Thyroid and Pituitary Therapy in Problems of Aberrant Growth and Development"—Dr. E. Kost Shelton, associate clinical professor of medicine, University of Southern California School of Medicine, Los Angeles, California.

Address: "Syndromes of Gall Bladder Disease—Surgical Management"—Dr. William D. Haggard, professor of clinical surgery, Vanderbilt University School of Medicine, Nashville, Tennessee.

Address: "The Therapeutic Value of Blood Transfusions"—Dr. Cyrus C. Sturgis, professor of internal medicine, University of Michigan Medical School, Ann Arbor, Michigan.

Address: "The Surgical Management of Brain Tumors"—Dr. Alfred W. Adson, professor of neurosurgery, Mayo Foundation Graduate School of the University of Minnesota; senior neurosurgeon of the Mayo Clinic, Rochester, Minnesota.

Intermission

7:00 P. M.—

Address: "Obscure Fevers as Diagnostic Problems"—Dr. George Blumer, David P. Smith clinical professor of medicine, Yale University School of Medicine, New Haven, Connecticut.

Address: "Treatment of Fracture Dislocations of the Cervical Vertebrae by Skeletal Traction and Fusion"—Dr. William G. Turner and Dr. William Cone, department of neurosurgery and orthopedics, McGill University, the Montreal Neurological Institute and the Royal Victoria Hospital, Montreal, Quebec, Canada.

Address: "Complications of Pregnancy"—Dr. Nicholson J. Eastman, professor of obstetrics, Johns Hopkins University School of Medicine, Baltimore, Maryland.

Address: "Acute Pancreatitis"—Dr. Eldridge L. Eliason, professor of surgery, University of Pennsylvania School of Medicine, Philadelphia, Pennsylvania, and Dr. William H. Erb by invitation.

Address: "The Factors Influencing Operability and Mortality in Carcinoma of the Large Bowel"—Dr. Richard B. Cattell, Lahey Clinic, Boston, Massachusetts.

TUESDAY, NOV. 1 — A. M.

Diagnostic Clinic: "Diagnostic Significance of Pain"—Dr. Frederick J. Kalteyer, clinical professor of medicine, Jefferson Medical College of Philadelphia, Philadelphia, Pennsylvania.

Diagnostic Clinic: "Thyroid Diseases"—Dr. Robert S. Dinsmore and Dr. A. Carlton Ernstone, Cleveland Clinic, Cleveland, Ohio.

Diagnostic Clinic: "Chronic Disease of the Liver"—Dr. Charles A. Elliott, professor of medicine, Northwestern University Medical School, Chicago, Illinois.

Diagnostic Clinic: "Clinical Significance of a Lump in the Breast"—Dr. Edmond M. Eberts, professor of surgery, McGill University Faculty of Medicine, Montreal, Quebec, Canada.

Diagnostic Clinic: "Obstruction of the Neck of the Bladder in Men"—Dr. William E. Lower, Cleveland Clinic, Cleveland, Ohio.

TUESDAY P. M.

Diagnostic Clinic: "Tic Douloureux"—Dr. Howard C. Naffziger, professor of surgery, University of California Medical School, San Francisco, California.

Therapeutic Clinic: "The Treatment of Dehydration and Edema"—Dr. James H. Means, Jackson professor of clinical medicine, Harvard University Medical School, Boston, Massachusetts.

Address: "The Present Status of Our Knowledge of the Suprarenal Cortical Hormone"—Dr. George A. Harrop, director of research, E. R. Squibb & Sons, New Brunswick, New Jersey.

Address: "Immediate and Ultimate Prognosis in Heart Disease"—Dr. Paul D. White, lecturer in medicine, Harvard University Medical School, Boston, Massachusetts.

Address: "Diagnosis and Treatment of Bronchogenic Carcinoma"—Dr. Arthur C. Christie, professor of clinical radiology, Georgetown University School of Medicine, Washington, D. C.

Address: "Gastroscopy as an Aid in Diagnosis"—Dr. Chevalier L. Jackson, professor of broncho-esophagology, Temple University School of Medicine, Philadelphia, Pennsylvania.

Address: "Adenomatous Thyroid With and Without Hyperthyroidism—Medical and Surgical Aspects"—Dr. Charles W. Mayo, assistant professor of surgery, University of Minnesota Medical School and Dr. Samuel F. Haines, assistant professor of medicine, Mayo Clinic, Rochester, Minnesota.

Dinner Intermission

7:00 P. M.—

Address: "Diagnosis and Treatment of Carcinoma of the Fundus of the Uterus"—Dr. Floyd E. Keene, William Goodell professor of gynecology, University of Pennsylvania School of Medicine, Philadelphia, Pennsylvania.

Address: "The Present Status of Our Knowledge of Anterior Poliomyelitis"—Dr. John C. Gittings, William H. Bennett professor of pediatrics, University of Pennsylvania School of Medicine, Philadelphia, Pennsylvania.

Address: "The Diagnosis and Treatment of Splenomegaly"—Dr. Allen O. Whipple, Valentine Mott professor of surgery, Columbia University College of Physicians and Surgeons, New York, New York.

Address: "Neoplasms of the Stomach; Correlation of Roentgenological and Clinical Aspects"—Dr. Fred J. Hodges, professor of roentgenology, University of Michigan Medical School,

and Dr. Robert M. Bartlett, instructor in department of surgery, University of Michigan Medical School, Ann Arbor, Michigan.

Address: "The Use of Spinal Anesthesia"—Dr. Thomas H. Russell, professor of clinical surgery, New York Postgraduate Medical School, Columbia University; executive officer and director of department of surgery, New York Postgraduate Medical School and Hospital, New York, New York.

WEDNESDAY, NOV. 2 — A. M.

Diagnostic Clinic: "Diagnosis and Treatment of Spinal Cord Tumors"—Dr. Walter E. Dandy, adjunct professor of neurological surgery, Johns Hopkins University School of Medicine, Baltimore, Maryland.

Diagnostic Clinic: Differential Diagnosis of Acute Abdominal Disease"—Dr. Claude F. Dixon, associate professor of surgery, University of Minnesota Graduate School of Medicine, Mayo Clinic, Rochester, Minnesota.

Diagnostic Clinic: "Diabetes Mellitus From an Endocrinological Viewpoint"—Dr. Elliott P. Joslin, clinical professor of medicine, Harvard University Medical School, Boston, Massachusetts.

Diagnostic Dermatological Clinic—Dr. Oliver S. Ormsby, clinical professor of dermatology, Rush Medical College, University of Chicago, Chicago, Illinois.

Diagnostic Clinic: "Treatment of Complicated Colles Fractures"—Dr. William Darrach, dean emeritus and professor of clinical surgery, Columbia University College of Physicians and Surgeons, New York, N. Y.

WEDNESDAY P. M.

Diagnostic Clinic: The Indications, Contraindications and End Results in the Surgical Treatment of Essential Hypertension"—Dr. George Crile, Cleveland Clinic, Cleveland, Ohio.

Address: "Hyperpyrexia by Physical Agents; Technic, Indications and Results"—Dr. John S. Coulter, associate professor of physical therapy, Northwestern University Medical School, Chicago, Illinois.

Address: "Clinical Significance of Hematuria"—Dr. William F. Braasch, professor of urology, University of Minnesota Graduate School of Medicine, Mayo Clinic, Rochester, Minnesota.

Address: "A Medical Appraisal of the Surgery of Pulmonary Tuberculosis"—Dr. William S. Middleton, dean and professor of medicine, University of Wisconsin Medical School, Madison, Wisconsin.

Address: "The Clinical Use of Sulfanilamide in Infectious Diseases"—Dr. Perrin H. Long, associate professor of medicine, Johns Hopkins University School of Medicine; lecturer in epidemiology, Johns Hopkins School of Hygiene and Public Health; associate physician, Johns Hopkins Hospital, Baltimore, Maryland.

Address: "Acute Appendicitis—Management and Mortality"—Dr. George P. Muller, professor of clinical surgery, Jefferson Medical College, Philadelphia, Pennsylvania.

Address: "Injuries to the Heart, Stab Wounds, and Contusions"—Dr. Claude S. Beck, associate professor of surgery, Western Reserve University School of Medicine, Cleveland, Ohio.

Address: "Improvements in Methods of Abdominal Drainage"—Dr. W. Wayne Babcock, professor of surgery and clinical surgery, Temple University School of Medicine, Philadelphia, Pennsylvania.

Assembly Dinner — 7 P. M.

THURSDAY, NOV. 3 — A. M.

Diagnostic Clinic: "Role of Diseases of the Sinuses to General Medicine"—Dr. Robert F. Ridpath, professor of laryngology and rhinology, Temple University School of Medicine, Philadelphia, Pennsylvania.

Diagnostic Clinic: "The Significance of Enlargement of the Abdomen in Children"—Dr. Irvine McQuarrie, professor of pediatrics, University of Minnesota Medical School, Minneapolis, Minnesota.

Diagnostic Clinic: "The Diagnosis of Bone Lesions"—Dr. Dean Lewis, professor of surgery, Johns Hopkins University School of Medicine, Baltimore, Maryland.

Diagnostic Clinic: "Non-Organic Disorders of the Digestive Tract"—Dr. Alfred Stengel, professor of medicine, University of Pennsylvania School of Medicine, Philadelphia, Pennsylvania.

Diagnostic Clinic: "Somatic Complaints in the Neuroses—Case Presentations"—Dr. Peter T. Bohan, professor of clinical medicine, University of Kansas School of Medicine, Kansas City, Missouri.

THURSDAY P. M.

Diagnostic Clinic: "Immediate Care of Fractures"—Dr. Clay Ray Murray, associate professor of surgery, Columbia University College of Physicians and Surgeons, New York, N. Y.

Diagnostic Clinic: "Hodgkin's Disease"—Dr. Warfield T. Longcope, professor of medicine, Johns Hopkins University School of Medicine, Baltimore, Maryland.

Address: "Immediate Versus Delayed Surgery in the Treatment of Acute Diseases of the Gall Bladder"—Dr. Charles Gordon Heyd, professor of clinical surgery, New York Postgraduate Medical School, Columbia University, New York, N. Y.

Address: "The Management of Peritonitis"—Dr. Vernon C. David, clinical professor of surgery, Rush Medical College, University of Chicago, Chicago, Illinois.

Address: "The Object and the Value of Preoperative and Postoperative X-ray Treatment in Carcinoma of the Breast"—Dr. George E. Pfahler, professor of radiology, Graduate School of Medicine, University of Pennsylvania, Philadelphia, Pennsylvania.

Address: "Subtemporal Decompression: Indications and Surgical Technique"—Dr. Eric Oldberg, professor and head of the department of neurology and neurological surgery, University of Illinois College of Medicine, Chicago, Illinois.

Address: "Relation of Trauma to Inguinal Hernia; Analysis of 1000 Herniotomies"—Dr. John J. Moorhead, professor of clinical surgery, New York Postgraduate Medical School, Columbia University, New York, N. Y.

Dinner Intermission

7 P. M.—

Address: "Classification and Treatment of the Epilepsies"—Dr. Wilder Penfield, professor of neurology and neurological surgery, McGill University Faculty of Medicine; director, Montreal Neurological Institute, Montreal, Quebec, Canada.

Address (Schneider Foundation): "The Clinical Significance of Retinal Changes in Arterial Hypertension"—Dr. Walter I. Lillie, professor of ophthalmology, Temple University School of Medicine, Philadelphia, Pennsylvania.

Address: "The Prognosis and Treatment of Rheumatic Heart Disease"—Dr. Fred M. Smith, professor of theory and practice of medicine, State University of Iowa College of Medicine, Iowa City, Iowa.

Address: "Psychotherapy in General Medicine"—Dr. Clarence B. Farrar, professor of psychiatry, University of Toronto Faculty of Medicine, Toronto, Ontario, Canada.

Address: "Pellagra"—Dr. John H. Musser, professor of medicine, Tulane University of Louisiana School of Medicine, New Orleans, Louisiana.

FRIDAY, NOV. 4 — A. M.

Diagnostic Clinic: Carcinoma of the Larynx With Special Reference to End Results"—Dr. Louis H. Clerf, professor of laryngology and bronchoscopy, Jefferson Medical College, Philadelphia, Pennsylvania.

Diagnostic Clinic: "Compressed Fractures of the Vertebrae"—Dr. Hubley R. Owen, professor of clinical surgery, Woman's Medical College of Pennsylvania, Philadelphia, Pennsylvania.

Diagnostic Clinic: "The Management of Gastric and Duodenal Ulcer, Jejunal Ulcer, and Gastrojejunocolic Fistula"—Dr. Frank Lahey, Lahey Clinic, Boston, Massachusetts.

Diagnostic Clinic: "The Differential Diagnosis of Diseases of the Chest and Abdomen"—Dr. David Riesman, emeritus professor of clinical medicine and professor of history of medicine, University of Pennsylvania School of Medicine, Philadelphia, Pennsylvania.

Diagnostic Clinic: "Diagnosis and Treatment of Obstructive Lesions of the Colon"—Dr. John F. Erdmann, attending surgeon, New York Postgraduate Medical School, New York, N. Y.

FRIDAY P. M.

Diagnostic Clinic: "Treatment of Fractures of the Neck of the Femur by Internal Fixation"—Dr. M. N. Smith-Petersen, clinical professor of orthopedic surgery, Harvard University Medical School, and chief of Orthopedic Service, Massachusetts General Hospital, Boston, Massachusetts.

Diagnostic Clinic: "Complications Following Surgery of the Biliary Tract"—Dr. Waltman Walters, professor of surgery, University of Minnesota Graduate School of Medicine, Mayo Clinic, Rochester, Minnesota.

Address: "The Diagnosis and Treatment of Peripheral Nerve Injuries"—Dr. Loyal Davis, professor of surgery, Northwestern University Medical School, Chicago, Illinois.

Address: "Obstruction of the Neck of the Bladder in Women"—Dr. Hugh H. Young, professor of urology, Johns Hopkins University School of Medicine, Baltimore, Maryland.

Address: "Studies in Growth—Precocious and Malignant"—Dr. Leonard G. Rowntree, director, Philadelphia Institute for Medical Research, Philadelphia, Pennsylvania.

Address: "Trauma of the Abdomen"—Dr. Arthur R. Metz, associate clinical professor of surgery, Rush Medical College, University of Chicago, Chicago, Illinois.

Address: "Influenzal Pneumonias: Observations on Their Pathological Features and Clinical Characteristics"—Dr. Robert G. Torrey, professor of medicine, Woman's Medical College of Pennsylvania, Philadelphia, Pennsylvania.

Too late to classify:

Address: "The Treatment of Bronchiectasis"—Dr. Edward D. Churchill, John Homans professor of surgery, Harvard University Medical School, Boston, Massachusetts.

State Court Outlines Medical Society's Powers

In connection with the action filed against the District of Columbia Medical Society by Arnold through the Federal Department of Justice, alleging federal antitrust laws have been violated, the following decision recently set out by the Supreme Court of the State of Washington is interesting, and brings into consideration the question of conflicting state and federal laws:

"Holding that the Charter, Constitution and By-Laws of an Incorporated Medical Society constitute a contract between the Society and its members, and that such contract is enforceable by courts, the decision laid down a number of important edicts. The members of a Medical Society are bound to obey its laws, rules and regulations, or be subject to fine, suspension or expulsion, and further that a Medical Society is entitled to adopt by-laws warranting expulsion of members unauthorizedly operating clinics or engaging in group contract practice. Whether such by-law was just, reasonable or wise, is a question of policy concerning only the Society and its Members."—*Detroit Medical News*, July 18, 1938.

News Items

Eleven North Dakota physicians specializing in obstetrics and gynecology, have organized the North Dakota Society of Obstetrics and Gynecology. Charter members and officers are: Dr. J. F. Hanna, Fargo, president; Dr. John H. Moore, Grand Forks, vice-president; Dr. August C. Orr, Bismarck, secretary; Drs. J. L. Conrad, Jamestown, and Paul W. Freise, Bismarck, governors. Other members are Drs. G. Wilson Hunter, Fargo; J. R. Dillard, Fargo; E. M. Ranson, Minot; A. M. Brandt, Bismarck; John D. Graham, Devils Lake, and B. M. Urenn, Fargo.

The Women's Field Army for the Control of Cancer, in Miles City, Montana, raised \$136.30 in their recent campaign.

Dr. C. W. Morrow who has been engaged in the Indian service at Mahnomen, Minnesota, for the past seven years, recently resigned from the service.

The board of directors of the Minnesota Birth Control League, recently heard Dr. Eric M. Matsner, New York, medical director of the American Birth Control League, discuss the importance of birth control.

Dr. P. R. Beckjord of Duluth has joined the staff of the Willmar, Minnesota, Clinic. A graduate of the University of Minnesota medical school, Dr. Beckjord interned at University Hospital, Minneapolis.

Dr. R. S. Leighton of Minneapolis, Minnesota, has become associated with Dr. W. F. Cantwell in International Falls, Minnesota. Dr. Leighton, who was graduated from the University of Minnesota medical school last year, is especially interested in the diseases of children and obstetrics.

Dr. M. J. Fardy, Minot, North Dakota, has gone to the west coast for several months because of ill health.

Dr. Frank O. Robertson, formerly of Grand Forks, North Dakota, has opened an office in East Grand Forks. A graduate of the University of Oregon, Dr. Robertson recently completed his internship at St. Joseph's Hospital, St. Paul, Minnesota.

Dr. D. J. Jacobson of Blackduck, Minnesota, has been appointed as a member of the Lake Julia Sanatorium Commission of Beltrami County. The appointment was made by the county board of commissioners. Dr. Jacobson replaces Dr. L. R. Dickenson of Puposky, whose term expired several months ago.

Seventy-nine crippled children from eight counties in Montana attended the annual orthopedic clinic at Bozeman, Montana. The clinic was conducted by Dr. Louis W. Allard of Billings, and the crippled children's division of the state department of public welfare.

The United States public health service has allocated \$2,400,000 for venereal disease prevention. States receiving allocations include: North Dakota, \$12,340; South Dakota, \$12,420; Montana, \$8,575; Minnesota, \$42,324; Iowa, \$43,564; Wisconsin, \$45,368.

Dr. F. H. Cooley, formerly of Redfield, South Dakota, has moved to Aberdeen where he is now practicing.

The University of Minnesota is offered close to \$75,000 in the will of Dr. Charles F. Dight, eugenics exponent and former faculty member, to promote the breeding of better babies. His will provides the fund be held in trust for the University "to promote biological race betterment, better human brain structure and mental endowment by spreading abroad the knowledge of the laws of heredity and the principles of eugenics."

The Yankton, South Dakota, District Medical Society met in Elk Point, South Dakota, recently together with representatives from the Inter-allied professions consisting of doctors, dentists, pharmacists and nurses. Candidates for election to the state legislature were invited to attend the meeting, the objective being the discussion of legislation for the better care of the sick. The meetings are to be continued monthly throughout the various state districts.

Dr. A. E. Henslin, LeRoy, Minnesota, was recently given a testimonial dinner by the LeRoy Commercial Club in recognition of his 47 years of service. Dr. Henslin, who observed his 73rd birthday in June, goes to his office daily.

Dr. L. W. Larson, Bismarck, North Dakota, has been named president-elect of the American Society of Clinical Pathologists. He was elected at the meeting in San Francisco in June, held in conjunction with the annual convention of the American Medical Association.

Dr. Marie K. Bepko, formerly of Elgin, Illinois, has opened offices in Cloquet, Minnesota, with her husband, Dr. R. H. Puumala. She is Cloquet's first woman doctor. Graduated from the University of Illinois College of Medicine in 1934, Dr. Bepko took special courses in women's and children's diseases. She also has had specialized training in the treatment of mental diseases.

Dr. H. J. Kurtin of Cudahy, Wisconsin, a graduate of Marquette University, has become associated with Dr. S. T. Kucera of Lonsdale, Minnesota. Dr. Kurtin will assist Dr. Kucera in his office in Lonsdale as well as in the office Dr. Kucera is opening in New Market.

Dr. Robert McGregor, son of Dr. Harry J. McGregor of Great Falls, Montana, has entered the practice of medicine with his father in Great Falls. The younger Dr. McGregor was graduated from the college of medicine, University of Iowa, in 1937, and interned at Ancker hospital in St. Paul.

Dr. D. Ernest Hodges, Prichard, Alabama, formerly faculty member of the medical school at Louisiana State University, has opened offices in Billings, Montana. A native of Mississippi, Dr. Hodges was graduated from the University of Kentucky medical school in 1927, served as resident physician at Presbyterian Hospital in Philadelphia for one year, and spent the next year as resident at Charity Hospital of Louisiana at New Orleans. He practiced in the southern part of Alabama for eight years.

Dr. A. Triolo, formerly of Philip, South Dakota, has been appointed head of the Pennington county health unit. He replaces Dr. H. D. Lien who has resigned to accept a position in the Fort Bidwell, California, Indian tuberculosis sanatorium. Dr. Triolo has had previous experience in public health work in South Dakota and last year was a South Dakota trainee in public health at Johns Hopkins University, Baltimore, Md.

Pre-school and infant clinics were conducted in Traill county, North Dakota, last month. Clinics were held in Mayville, Portland, Clifford, Buxton, Hatton and Hillsboro. The division of Child Hygiene, State Department of Health at Bismarck, sponsors these clinics; funds are provided by the state government.

Dr. A. T. Hass of Missoula, Montana has severed his connection with the Northern Pacific hospital to devote his entire time to private practice in Missoula. Associated with him will be Dr. Fred H. Lowe. Dr. Hass is being succeeded on the hospital staff by Dr. Horace E. Hall who recently arrived in Missoula from Glendive where he was a member of the Northern Pacific hospital staff.

The Postgraduate Medical Institute's courses at the University of Minnesota which have been offered to practicing physicians during the past two years in connection with the Center for Continuation Study are to be continued during the next five years. The courses evoked such enthusiastic responses on the part of physicians that the Commonwealth Fund of New York is providing a subsidy for the further development of the program. This will make possible a study of the need for and the effectiveness of the courses offered, and experimentation with various types of instruction. Dr. William A. O'Brien has been appointed Director of Postgraduate Medical Education.

A Children's Psychiatric Clinic is to be established at the University of Minnesota; it will be affiliated jointly with the Department of Pediatrics and the Department of Psychiatry. The Clinic has been made possible by gifts presented to the University by the Trustees of the Stevens Avenue Home of Minneapolis and the Commonwealth Fund of New York.

The Bureau of Medicine and Surgery, Navy Department, Washington, D. C., has announced that a number of internships and commissions will be offered to graduates of Class A medical schools. Examinations will begin on November 7, 1938, and applications should be on file at least one month prior to that date. Commissions are offered to qualified candidates who have completed internships in civilian hospitals. Senior medical students who qualify for appointments to internships in naval hospitals, upon satisfactory completion of their internships, will be allowed to appear for competitive examinations for permanent appointments. Applicants must be between the ages of 21 and 32 years.

Dr. R. A. Glabe of Oronoco, Minnesota has joined Dr. J. A. Slocumb in Plainview, Minnesota and is now practicing in that office. Dr. Glabe who was graduated from the University of Minnesota medical school served his internship at St. Luke's hospital in Duluth.

Dr. Mars L. Madsen who practiced in Webster, South Dakota for the past several years, is now located in Sisseton, South Dakota.

A free clinic for adults was conducted in Jackson, Minnesota last month. Doctors S. A. Slater and R. E. Johnson of the Southwestern Minnesota Sanatorium at Worthington conducted the examinations. The clinic was made possible through the sale of Christmas Seals and was arranged under the direction of the Public Health Nursing Service in coöperation with the local physicians.

Dr. Willard H. Hill has opened an office at Centerville, South Dakota. For the past two years Dr. Hill has been connected with the St. Joseph's hospital in Sioux City. He is a graduate of the University of Nebraska medical school, class of '36.

Dr. Mattie Bullard who has been associated with the public health department of the University of Minnesota for several years, has resigned her position to take up her new duties with the public health department of the Gary, Indiana public schools.

Dr. Howard C. Robertson of Nashville, Tennessee, is now practicing in Hope, North Dakota.

Dr. Chester A. Clark of Great Falls, Montana, is now practicing in Eureka, Montana.

Dr. August F. Jensen, formerly of Rugby, North Dakota, has joined the staff of the Healy, Law, Woutat, Moore clinic in Grand Forks. He will be associated with the department specializing in diseases of the eye. Dr. Jensen was graduated from Northwestern University Medical School in 1924 and later took postgraduate work at the University of Pennsylvania.

Necrology

Dr. Oscar C. Dixon, 71, of Adams, North Dakota, Walsh county physician for many years, died at a Graf-ton hospital July 21, 1938. A native of Niles, Michigan, Dr. Dixon was graduated from the University of Michigan medical school in 1904. He began his practice at Bountiful, Utah, where he remained four years, and then moved to Grants Pass, Oregon. In 1917 he came to Walsh county, practicing first at Fairdale for ten years and then moving to Adams.

Dr. T. H. Baer, 64, of Timber Lake, South Dakota, died in Mobridge, July 25, 1938. Well known in north central South Dakota and at the time of his death Dewey County health officer, Dr. Baer had practiced in Timber Lake for twenty-seven years. He was graduated from the University of Iowa medical school in 1902.

Dr. A. E. Brown, 75, pioneer Webster, South Dakota physician died August 4, 1938, at Yankton, South Dakota. A graduate of the University of Illinois in 1905, Dr. Brown practiced in Webster about 40 years.

Dr. John Esler, 61, died at his home in Cereal, Alberta, Canada, recently. Dr. Esler formerly practiced in Milton, North Dakota.

LIST OF PHYSICIANS LICENSED BY THE MINNESOTA STATE BOARD OF MEDICAL EXAMINERS
ON MAY 13, 1938

APRIL EXAMINATION

Name	School	Address
Ahl, Carl Willard	U. of Minn., M.B. 1937	Swedish Hospital, Minneapolis, Minn.
Ansprenger, Aloys Georg	U. of Munich, M.D. 1933	Mayo Clinic, Rochester, Minn.
Berman, Abe E.	U. of Minn., M.B. 1937	644 Elwood Ave. N., Minneapolis, Minn.
Brown, Hugh Osborne	Northwestern U., M.D. 1937	Mayo Clinic, Rochester, Minn.
Burkhart, Roger John	U. of Minn., M.B. 1938	Chaska, Minn.
Campbell, Donald Clarence	U. of Nebr., M.D. 1935	Mayo Clinic, Rochester, Minn.
Chalek, Jack I.	U. of Minn., M.B. 1937	954 Ashland Ave., St. Paul, Minn.
Cochrane, Ray Fleming	U. of Minn., M.B. 1936, M.D. 1937	1810 Bryant Ave. S., Minneapolis, Minn.
Colyer, George Edward	U. of Ill., M.D. 1936	Mayo Clinic, Rochester, Minn.
Cronin, Thomas Dillon	U. of Texas, M.D. 1932	Mayo Clinic, Rochester, Minn.
Darling, John Pendleton	Rush Med. Col., M.D. 1937	Mayo Clinic, Rochester, Minn.
Doehring, Paul Christoph, Jr.	Rush Med. Col., M.D. 1937	Mayo Clinic, Rochester, Minn.
East, John	U. of Okla., M.D. 1937	Ancker Hospital, St. Paul, Minn.
Feinstein, Julius Yale	U. of Minn., M.B. and M.D. 1937	Trinity Hospital, Minot, N. Dak.
Fischer, Verrill John	Rush Med. Col., M.D. 1937	Ancker Hospital, St. Paul, Minn.
Flink, Edmund Berney	U. of Minn., M.B. 1937	U. of Minn. Hospitals, Minneapolis, Minn.
Gordon, Martin Norton	U. of Minn., M.B. 1937	1018 Oliver Ave. N., Minneapolis, Minn.
Gorman, William Ambrose	Western Reserve, M.D. 1932	18 S. 54th Ave. E., Duluth, Minn.
Greene, Laurence Francis	Harvard U., M.D. 1936	Mayo Clinic, Rochester, Minn.
Hauge, Erling Trygve	U. of Minn., M.B. 1937	Clarkfield, Minn.
Hoffbauer, Frederick William	U. of Minn., M.B. and M.D. 1937	U. of Minn. Hospitals, Minneapolis, Minn.
Hollinshead, William Henry, Jr.	U. of Minn., M.B. 1937	U. of Minn. Hospitals, Minneapolis, Minn.
Holmstrom, Emil Gustave	U. of Minn., M.B. 1937	U. of Minn. Hospitals, Minneapolis, Minn.
Holzappel, Fred C.	U. of Minn., M.B. 1937	St. Mary's Hospital, Minneapolis, Minn.
Hudec, Elwyn R.	U. of Minn., M.B. 1937	Silver Lake, Minn.
Hughes, Bernard J.	U. of Minn., M.B. 1937	St. Luke's Hospital, Duluth, Minn.
Jones, Herbert William, Jr.	Harvard U., M.D. 1937	2418 W. 22nd St., Minneapolis, Minn.
Katzovitz, Hyman	U. of Minn., M.B. 1937	Ancker Hospital, St. Paul, Minn.
Kendrick, Marvin Hayne	Harvard U., M.D. 1935	Mayo Clinic, Rochester, Minn.
Kershner, Calvin Myles	U. of Pa., M.D. 1936	Mayo Clinic, Rochester, Minn.
Knutson, Lewis Arthur	U. of Minn., M.B. 1937	Mpls. General Hospital, Minneapolis, Minn.
Kremen, Arnold James	U. of Minn., M.B. 1937	Mpls. General Hospital, Minneapolis, Minn.
Lannin, Bernard G.	U. of Minn., M.B. 1937	Mabel, Minn.
Leary, William Vincent	U. of Minn., M.B. 1937	Ancker Hospital, St. Paul, Minn.
Leitschuh, Linus Frederick	U. of Minn., M.B. 1937, M.D. 1938	Mpls. General Hospital, Minneapolis, Minn.
Mavrelis, William Peter	U. of Minn., M.B. 1936, M.D. 1937	Cook County Hospital, Chicago, Ill.
McCullough, John Andrew Lawson	U. of Toronto, M.D. 1934	Mayo Clinic, Rochester, Minn.
McKean, Frank Flanders	U. of Minn., M.B. 1938	St. Barnabas Hospital, Minneapolis, Minn.
Merrill, Robert William	U. of Minn., M.B. 1937	Starbuck, Minn.
Mickelson, John Charles	U. of Minn., M.B. 1938	221 Van Brunt St., Mankato, Minn.
Moren, Leslie Arthur	U. of Minn., M.B. 1937	Ancker Hospital, St. Paul, Minn.
Moss, Arthur James	U. of Minn., M.B. 1937	Mpls. General Hospital, Minneapolis, Minn.
Munn, Elizabeth L.	U. of Ore., M.D. 1936	Mayo Clinic, Rochester, Minn.
Murphy, James Edward	U. of Minn., M.B. 1937	2908 Fremont Ave. N., Minneapolis, Minn.
Nesheim, Martin Otto	U. of Iowa, M.D. 1937	1424 London Road, Duluth, Minn.
O'Brien, John Patrick	Jefferson Med. Col., M.D. 1935	Mayo Clinic, Rochester, Minn.
Overpeck, Darrell O.	Indiana U., M.D. 1934	Mayo Clinic, Rochester, Minn.
Parson, Edwin Irvine	U. of Minn., M.B. 1937	St. Luke's Hospital, Duluth, Minn.
Pastore, Pietro Nicolino	Med. Col. of Va., M.D. 1934	Mayo Clinic, Rochester, Minn.
Plotke, Harry Louis	U. of Minn., M.B. 1937	Ancker Hospital, St. Paul, Minn.
Pollock, George Angus	U. of Glasgow, M.B. & Ch.B. 1923	Mayo Clinic, Rochester, Minn.
Rein, Gerald Norman	U. of Mich., M.D. 1933	Mayo Clinic, Rochester, Minn.
Roberts, Lewis Joshua	U. of Minn., M.B. 1937	Miller Hospital, St. Paul, Minn.
Robertson, Frank O.	U. of Ore., M.D. 1937	Gillette State Hosp., St. Paul, Minn.
Ross, Alexander Joseph	U. of Minn., M.B. 1937	3115 Fremont Ave. S., Minneapolis, Minn.
Rousseau, Maurice Cyprian	U. of Minn., M.B. 1937	Miller Hospital, St. Paul, Minn.
Rudin, Harry N.	U. of Minn., M.B. 1938	812 Wash. Ave. S. E., Minneapolis, Minn.
Schroder, John Richard	U. of Minn., M.B. 1938	114 Laurie St., Duluth, Minn.
Schweiger, Lamont R.	Rush Med. Col., M.D. 1937	Mayo Clinic, Rochester, Minn.
Sherman, Alfred Gustav	U. of Minn., M.B. 1938	St. Barnabas Hospital, Minneapolis, Minn.
Simonson, Donald Bennett	Rush Med. Col., M.D. 1937	Swedish Hospital, Minneapolis, Minn.
Squire, Everett Wayne	Rush Med. Col., M.D. 1937	Mayo Clinic, Rochester, Minn.
Strassmann, Erwin Otto	Friedrich-Wilhelms U., M.D. 1922	Mayo Clinic, Rochester, Minn.
Tingdale, Carlyle	U. of Minn., M.B. 1937, M.D. 1938	Mpls. General Hospital, Minneapolis, Minn.
Tudor, Robert Bruce	U. of Minn., M.B. 1937	Asbury Hospital, Minneapolis, Minn.
Uihlein, Alfred, Jr.	Johns Hopkins U., M.D. 1935	Mayo Clinic, Rochester, Minn.
Welte, Edwin Joseph	U. of Minn., M.B. 1937	Mpls. General Hospital, Minneapolis, Minn.
Will, Charles Bishop	U. of Minn., M.B. 1938	St. Mary's Hospital, Duluth, Minn.

BY RECIPROCITY

Elliott, William	Rush Med. Col., M.D. 1927	Virginia, Minn.
Laney, Howard John	U. of Wis., M.D. 1935	Prescott, Wis.
Lipp, Frank Edward	Creighton U., M.D. 1934	Appleton, Minn.
Thompson, Harlow B.	U. of Ore., M.D. 1935	C.C.C. Co. 2703, Park Rapids, Minn.

NATIONAL BOARD CREDENTIALS

Morrison, Charlotte Jean	U. of Minn., M.B. 1933, M.D. 1934	1017—18½ Ave. N. E., Minneapolis, Minn.
Neff, Walter Scott	Jefferson Med. Col., M.D. 1932	Virginia, Minn.
Schmitt, George Fredrick, Jr.	U. of Maryland, M.D. 1935	Mayo Clinic, Rochester, Minn.

LIST OF PHYSICIANS LICENSED BY THE MINNESOTA STATE BOARD OF MEDICAL EXAMINERS
ON JULY 16, 1938
JUNE EXAMINATION

Name	School	Address
Anderson, Robert Edward	U. of Minn., M.B. 1935	4145 Park Ave. S., Minneapolis, Minn.
Arey, James Blanding	U. of Minn., M.B. 1937	Excelsior, Minn.
Arko, Joseph Lawrence	U. of Minn., M.B. 1938	317—2nd Ave. S., Chisholm, Minn.
Biorn, Carl Ludvig	U. of Minn., M.B. 1938	Jackson, Minn.
Borowicz, Leonard Ambrose	U. of Minn., M.B. 1938	Strandquist, Minn.
Breslow, Lester	U. of Minn., M.B. 1938	U. S. Marine Hospital, Staten Island, N. Y.
Buehler, Martin Stowell	U. of Minn., M.B. 1938	429 Union St. S. E., Minneapolis, Minn.
Cameron, John Hugh	McGill U., M.D. 1937	Bagley, Minn.
Ceplecha, Stanley Francis	Marquette U., M.D. 1938	New Prague, Minn.
Childs, Theron Baker	Northwestern U., M.D. 1938	St. Luke's Hospital, Duluth, Minn.
Clarke, William O.	U. of Minn., M.B. 1937, M.D. 1938	411—14th Ave. S. E., Hibbing, Minn.
Cohen, Ephraim Bernard	U. of Minn., M.B. 1938	1001 James Ave. N., Minneapolis, Minn.
Condon, William B.	McGill U., M.D. 1933	Mayo Clinic, Rochester, Minn.
Danstrom, John Richard	Northwestern U., M.D. 1938	St. Mary's Hospital, Duluth, Minn.
Demo, Robert Anthony	U. of Minn., M.B. 1938	Blue Earth, Minn.
Farkas, John Victor	U. of Minn., M.B. 1938	1199 Albemarle St., St. Paul, Minn.
Frank, Harold Joseph	U. of Minn., M.B. 1938	New Prague, Minn.
Freedland, Morris	U. of Minn., M.B. 1938	1621 Thomas Pl. N., Minneapolis, Minn.
Furst, John N.	U. of Minn., M.B. 1938	221 Melbourne Ave. S. E., Minneapolis, Minn.
Gaviser, David	U. of Minn., M.B. 1937	617 Washington Ave., Minneapolis, Minn.
Guloién, Hans Edward	Rush Med. Col., M.D. 1938	416 S. 8th St., Fargo, N. Dak.
Heersema, Philip Henry	U. of Pa., M.D. 1933	Mayo Clinic, Rochester, Minn.
Hiebert, Homer L.	U. of Kans., M.D. 1937	133 Western Ave., Topeka, Kansas
Hoffmann, Heinz Otto Edward	Rush Med. Col., M.D. 1937	Mayo Clinic, Rochester, Minn.
Jeronimus, Henry Jerger, Jr.	U. of Minn., M.B. 1938	Mpls. General Hospital, Minneapolis, Minn.
Kabler, Paul Wesley	U. of Minn., M.B. 1938, M.D. 1938	State Dept. of Health, Univ. Campus, Mpls.
Karleen, Conrad Immanuel	U. of Minn., M.B. 1938	St. Louis City Hospital, St. Louis, Mo.
Karon, Irvine Millard	U. of Minn., M.B. 1937	2007 Summit Ave., St. Paul, Minn.
Katz, Robert A.	U. of Minn., M.B. 1938	Pioneer Hall, U. of Minn., Minneapolis.
Killins, Jack Adrian	U. of Nebr., M.D. 1937	125 W. College Ave., St. Paul, Minn.
Krieser, Albert Edward	Loyola U., M.D. 1938	1211 N. 4th St., Mankato, Minn.
Kurtin, Henry John	Marquette U., M.D. 1938	Lonsdale, Minn.
Leffel, James Monahan, Jr.	Indiana U., M.D. 1935	Mayo Clinic, Rochester, Minn.
Lockwood, William Wayne	U. of Ill., M.D. 1936	Mayo Clinic, Rochester, Minn.
MacKenzie, Duncan Stuart, Jr.	U. of Minn., M.B. 1936, M.D. 1937	Havre, Mont.
Meyer, Jules Owens	U. of Minn., M.B. 1937	144 Amherst St., St. Paul, Minn.
Nichols, Donald Richardson	U. of Minn., M.B. 1937	5129 Wentworth Ave., Minneapolis, Minn.
Papermaster, Theodore C.	U. of Minn., M.B. 1938	705—3rd Ave. S., St. Cloud, Minn.
Paulson, Elmer Clarence	U. of Minn., M.B. 1937	Fergus Falls, Minn.
Pfuetze, Karl Hamilton	U. of Kans., M.D. 1934	Nopeming San., Nopeming, Minn.
Ravits, Everett Cyrus	U. of Minn., M.B. 1938	918 Osceola Ave., St. Paul, Minn.
Redding, Marion Diet	Tulane U., M.D. 1934	Mayo Clinic, Rochester, Minn.
Seidenstein, Howard Robert	U. of Minn., M.B. 1938	160 Remington Pl., New Rochelle, N. Y.
Shepard, Virgil Duncan	U. of Mich., M.D. 1936	Mayo Clinic, Rochester, Minn.
Terrell, Bernard Joseph	Ohio State U., M.D. 1932	Nopeming San., Nopeming, Minn.
Tracht, Robert Russell	Loyola U., M.D. 1932	227 Melbourne Ave. S. E., Minneapolis.
Wilson, John Francis	Jefferson Med. Col., M.D. 1937	University Hospital, Minneapolis, Minn.
Wolsztajn, Symcha-David	U. of Paris, M.D. 1935	523 Hennepin Ave., Minneapolis, Minn.

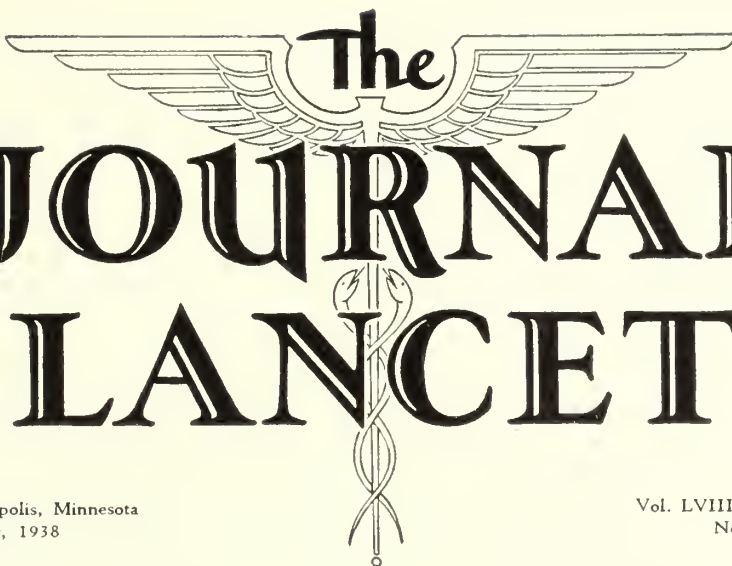
BY RECIPROCITY

Garthe, John Joseph	Loyola U., M.D. 1936	Shakopee, Minn.
Haller, William Morgan, Jr.	U. of Nebr., M.D. 1933	Cass Lake, Minn.
Hanson, Harold Birger	Rush Med. Col., M.D. 1930	1891 Portland Ave., St. Paul, Minn.
Harrison, Malcolm Wilbur	Tulane U., M.D. 1930	Mayo Clinic, Rochester, Minn.
Movius, Arthur James, Jr.	Northwestern U., M.B. 1936, M.D. 1937	Mayo Clinic, Rochester, Minn.
Raetz, Sylvester Joseph	Marquette U., M.D. 1937	Watkins, Minn.

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The Value of Roentgen Rays in Diagnosis*

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ROENTGENOLOGY is one of the youngest of the medical sciences. It was introduced through the medium of the public press on January 6, 1896, by the announcement of the discovery of a new light "which for the purposes of photography will penetrate wood, cloth and most other organic substances." The news was cabled from London to all of the civilized countries of the world after a detailed description of the new discovery was published in the *Wiener Presse* and quickly copied by other continental papers.

The possibilities of the use of the X-ray, as it was designated by the discoverer, for diagnostic purposes were discussed at a meeting of the Berlin Medical Society on January 5 and the Society of Internale Medicine in Berlin on January 6, 1896. By the end of February, 1896, the method was in comparatively general use as a diagnostic procedure in many countries.

Fortunately, the demand for machinery and accessories from the medical profession stimulated the interest of industry in this new light and considerable sums of money were devoted to research in the development and improvement of machines and of the paraphernalia associated with these in the production of roentgenograms. The results of this interest were most apparent in the period of and following the World War.

In 1896, the maximal energy available for the production of roentgen rays was 50 to 100 kilovolts at a fractional part of 1 milliamperes; by 1933, it was 100 kilo-

volts at 1000 milliamperes, or more, for diagnostic work. Intensifying screens were used in 1896, but it was several years before they came into general use; their greatest development was in the period from 1914 to 1922. The Coolidge tube was introduced in 1912 and made it possible to create and to maintain vacuums sufficiently high to permit of stable and reproducible operation. The Bucky-Potter diaphragm (1918), by the suppression of secondary radiation, considerably enhanced the brilliancy of detail in the roentgenogram.

Photographic film was first produced in 1889, but it was not considered for roentgenographic purposes until 1906. Some years of research were necessary after that to insure its commercial success on a cellulose acetate (noninflammatory) base; this was placed on the market in 1924. In the meantime, the duplitized film (1918) and alterations in sensitiveness (1923) effected a radical shortening of exposure time, as well as a lowering of the kilovoltage necessary for the making of efficient roentgenograms.

The roentgenogram (or X-ray as it is commonly called) is a reproduction in relief of the various structures of the body. The more compact structures (bone) offer a greater resistance to the passage of roentgen rays; their image in the roentgenogram is opaque. Different portions of bone offer a greater or a lesser resistance; the compact cortex is more opaque, the density lessens toward the medullary portion. Soft tissue structures vary in the intensity of the shadow they cast in proportion to their bulk. The hollow viscera of the body are completely transparent to roentgen rays. These structures

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cannot be visualized except when distinguished by distention with gas or by the use of an opaque medium.

Interpretation of roentgenograms is based largely on two factors; changes in contour and alterations in density. These factors may occur singly or in combination. The pioneers in roentgenology established the appearance of the normal and its range of variation. A knowledge of the normal is essential to the proper interpretation of roentgenographic findings. By comparison of gross anatomicpathologic specimens, particularly sectioned specimens, with the roentgenographic reproductions of the same, these pioneers demonstrated that the roentgenogram did actually represent a facsimile of all the structures, normal and abnormal.

An entirely new field of investigation was created with the advent of the roentgen ray. It was possible to study pathology in the living. By serial roentgenography, the progress or recession of a given morbid process could be followed throughout its course. The results of various forms of therapy could be visualized by periodic roentgenographic examinations. The affinity of specific types of disease entities for definite tissues was recorded graphically. The situation in these tissues was found to be approximately uniform in large series of cases. These idiosyncrasies of disease entities were published in papers, in monographs and in books and constitute the important part of the literature referring to the new science of roentgenology.

Roentgenography effected the "finger printing" of the disease entity. It supplemented conjecture in medicine with visible evidence. The shortcomings of roentgenologic examination as a diagnostic method, so glibly stated by some even today, are really not faults of the method; they are faults of the individual. What these complaints really mean is that those who utter them have not the knowledge, nor have they been able to find someone who has the knowledge, the judgment, or the patience to enable him to recognize the evidence which is present in the roentgenogram. Inadequate technic or an examination not comprehensive enough may cloud the evidence or even fail to reveal it at all.

As a preface to a review of some of the fundamental principles underlying it, I want to warn you that the interpretation of roentgenographic evidence is not a simple undertaking. Frequently it incurs a serious responsibility. An erroneous conclusion may influence subsequent therapy to an extent that may be detrimental or even disastrous to the interests of the patient and the reputation of the professional man.

Roentgenography has proved to be the diagnostic method of choice in the investigation of lesions involving bones and joints. It has long been our practice in the Mayo Clinic, in order to save the time of the patient and clinician, to make a primary roentgenologic diagnosis and correlate the roentgenologic, clinical and all other data subsequently. If these are not all in accord, a consultation is arranged. By such an arrangement, the best results are obtained.

Limitation of time necessitates a synoptic review of this subject. The pathognomonic feature of the benign

neoplasm involving bone is the preservation of the continuity of the shadow of the cortical contour. The cortex of the bone may be expanded or otherwise distorted but its continuity is never broken. In the case of flat bones, such as the os innominatum, in which the contour shadow cannot be thrown into relief, the filling defect in the bone resulting from the tumor has a smooth margin and is sharply demarcated on all its borders. When the tumor breaks through or projects from the cortex and invades the contiguous soft tissue structures, the contour of the tumor shadow remains intact and usually is sharply demarcated.

The characteristic of the malignant neoplasm involving bone, with but few exceptions which will be mentioned later, is a dissolution of the continuity of the contour of the cortical shadow at some point. In the case of flat bones, the shadow of the filling defect in the bone has an irregular, indistinct or serrated margin or fades imperceptibly into that of the uninvolved bone. When the neoplasm breaks through the cortex and invades the adjacent structures, the invasion is a promiscuous one. The dividing line between the tumor and the tissues is not discernible in the case of osteogenic sarcoma: in the case of Ewing's tumor it is but faintly apparent in comparison to the definitely sharp demarcation of the benign tumor.

These two facts form the keystone of the diagnosis of neoplastic lesions in bone. Lack of knowledge of these or failure to apply this knowledge intelligently probably has been behind more tragic results than almost anything else in medicine or surgery.

Various attempts have been made to simplify the classification of benign and malignant tumors. No attempt will be made to follow any other subdivision of these groups than that recognizable through their roentgenographic characteristics.

A tumor is described as an abnormal mass of tissue, not inflammatory, arising without apparent cause from cells of preëxistent tissue and having no physiologic function; a neoplasm is described as a new growth, atypical in structure and termination.

When the so-called benign tumors of bone are studied, it immediately becomes apparent that the majority of them at least, if not all of them, occur in early life and in puberty. Many of them are situated at the growing ends of bone and, in not a few, there is a distinct tendency toward cessation of growth and even regression at about the period when the development of the skeleton is complete. All of these facts point to a disturbance in development of the cartilaginous elements in the formation of bone and joints. It may be difficult to draw the line between the abnormal and the normal. For example, a limited outgrowth of preëxistent cartilage occurring in the ribs and about the joints is distinguished as an echondrosis. True progressive neoplasms composed of cartilage appear in the same situations and also in tissues not normally containing cartilage and these are called chondromas or enchondromas. Chondromas occur most often as single or multiple tumors of the hands

and feet. In many cases of chondroma, the formation of cartilaginous matrix is imperfect and a simple hyaline material takes its place. This type of tumor is transparent to roentgen rays. It may cast a shadow only when it is of sufficient bulk. The only evidence of the tumor may be a smooth-margined filling defect in the bone, the result of pressure erosion of the tumor. Calcification with the deposition of phosphate and carbonate of lime may incrust both the matrix and the cells. The tumor may be partly fibrillated and so earn the label of fibroma. Mucinous material may take the place of the matrix with a resultant change in name to myxochondroma. Ossification of the chondroma occurs; depending on the content of the bone cell, the end result is an osteochondroma or an osteoma.

The pathologic report on these benign tumors may be any one or a combination of the above names. As evidence of the confusion that might result from nomenclature, Ewing discussed exostosis with osteoma; Geschickter and Copeland classified it as an osteochondroma, and Greig placed it in the category of biotrophic osteoma (aberration of normal growth). All include the multiple congenital exostosis (hereditary deforming chondrodysplasia or diaphyseal aclasis), which Keith most lucidly explained on the basis of a congenital defect in the periosteum which acts as a ferrule in control of the architecture of bone. For clarity of purpose, these are brought together in this manner to demonstrate that they all are like "The colonel's lady and Judy O'Grady . . . sisters under their skins."

Clinically they are benign; potentially they are malignant. Unless demanded because of mechanical interference or some other complicating factor, surgical removal of these should not be attempted. Unless every last cartilage cell can be removed or destroyed, these tumors will recur. In recurrence, frequently, there is a mutation of the cell and a chondrosarcoma or an osteochondrosarcoma results. Obviously, no surgical procedure is justifiable in any of these cases before mature growth is attained.

These tumors are slow growing; a sudden acceleration of growth calls for roentgenographic examination and careful search for evidence of dissolution of the cortical contour and promiscuous invasion of the contiguous soft tissues indicative of sarcomatous change. Radiotherapy does not influence the growth or recession of these benign tumors and has only a limited value in the treatment of chondrosarcoma.

The above mentioned group is referred to as osteogenic benign tumors. The word "osteogenic" is used here not in the sense of bone-forming, but to designate tumors arising from bone cells or bone-forming cells and to distinguish them from tumors having their origin in cells of bone marrow or the vessels of bone or marrow.

Angiomas affecting bone are comparatively rare. Hemangiomas involving the shafts of long bones, the skull and the vertebral bodies have been noted. These tumors are essentially benign in character and their

roentgenographic image is that of a benign neoplasm. In the shafts of long bones they expand the cortex but do not extend deeply into the medullary or cancellous spaces, producing what has been described as a "soap bubble effect" with some similarity to giant-cell tumor in appearance. In the vertebral body it is characterized by a vertical striated appearance on a background of decreased density. Pathologic fracture frequently occurs with this lesion. Like giant-cell tumors, these tumors respond well to radiotherapy. The two most important conditions that stimulate benign tumor are the cysts in bone and giant-cell tumor.

The solitary bone cyst almost universally involves the metaphysis, probably arises in childhood and may be latent over many years. Pathologic fracture may occur and call attention to the lesion. These may originate in infection or trauma with subsequent hemorrhage. Solitary cysts may have their origin in osteodystrophia fibrosa (osteitis fibrosa cystica), a condition in which the bone marrow is transformed into fibrous connective tissue rich in giant cells with resorption of the compact cortex, followed by replacement with finely porous and often uncalcified new bone. Within these fibrous regions are cysts and so-called solid brown tumors composed of numerous, multinuclear giant cells in a spindle-cell matrix containing deposits of hemosiderin.

Trauma has been considered as one of the etiologic factors, with hemorrhage into the bone marrow. The products of hemorrhage remain localized. Maintenance of functional activity acts as a pathologic irritant and produces secondary hemorrhage. Owing to the peculiar structure and circulatory system of bone, permanent congestion in the blood vessels and lymph vessels is produced. This congestion, together with continuous mechanical irritation, leads to osteodystrophia fibrosa. The lesion has its origin in the metaphysis. With the development of the bone, the lesion is carried away from the metaphyseal line toward the central portions of the shaft. The end result is the so-called localized form of osteitis fibrosa cystica or fibrocystic disease. This lesion is also referred to as osteodystrophia fibrosa, localized; osteodystrophia fibrosa generalisata is now generally recognized as an end result of advanced parathyroid disease. Simple cysts and osteodystrophia fibrosa are generally conceded to have their commencement in the adolescent period.

The consensus is that giant-cell tumor is a granuloma (a tumor made up of granulation tissue), probably having the same origin as osteodystrophia fibrosa. Peculiarly, the situation of the giant-cell tumor is preponderantly in the epiphysis, where it apparently has its origin in trauma or infection, with resultant hemorrhage. In contrast to the benign tumor, these cysts and tumors seem to occur from an imbalance of reparative processes, that is, the activities of the fibroblasts are outdone by those of the giant cells (osteoclasts), whereas the benign tumor occurs from an imbalance of normal processes of growth. Both still retain some control of growth which, as Broders pointed out, distinguishes them as benign processes. This control is apparent in the roent-

genogram in the retention of the continuity of the cortical contour.

The giant-cell tumor assumes an asymmetrical position in the epiphysis. Commencing subcortically, the tumor extends toward the central portion of the epiphysis at the expense of the cancellous bone. At this stage, it is traversed by trabeculae dividing the tumor into several loculi, presenting a typical picture of benign tumor. This may be displaced later by homogeneous lysis in the central portion of the bone; this lysis extends into the cortex leaving only a thin shell of bone. This thin shell of bone may be expanded until it becomes invisible in the roentgenogram and the tumor may extend beyond the cortex, pushing the soft tissues ahead of it. At this stage, it may be very difficult to distinguish it roentgenographically from a malignant neoplasm. Careful study of the outline of the soft tissue shadow will reveal that it has a smooth margin and is intact. A remnant of the cortical shell persists as a wavy outline of bone passing over the soft tissue shadow at the proximal end of the bone. Occasionally, the shaft of the bone may be telescoped for some distance into the soft tissue shadow. In some cases, all evidence of benignancy may be masked to such a degree that roentgenographic interpretation becomes extremely difficult, but a careful study of the soft tissue invasive shadow usually will reveal some evidence of continuity of outline.

Having reviewed the benign neoplasms involving bone and the neoplasms which simulate them, before turning to the roentgenographic characteristics of malignant tumors involving bone, consideration will be given to malignant lesions which simulate benign neoplasms.

Periosteal fibrosarcoma (extraperiosteal sarcoma) invades the bone from without and the destructive lesion in bone, when the bone is involved, is frequently the result of pressure erosion. In such cases, the filling defect in the bone has a smooth margin and the continuity of the contour shadow is maintained.

Myeloma is the other malignant lesion involving bone which, in its roentgenologic image, violates every principle suggested for distinguishing between benign and malignant tumors. In the majority of lesions, multiple, discrete regions of bone destruction occur; each defect is as smooth margined as if it had been made with a steel punch. In some cases, the tumor expands the cortex of the bone, occasionally to a considerable extent; the cortex may be thinned until it is imperceptible, but the soft tissue shadow remains demarcated much as it does in cases of giant-cell tumor and hemangioma. There is never complete dissolution of the outline as there is in cases of osteogenic sarcoma. The shaft of the bone may be telescoped for some distance into the shadow of the tumor just as it is in cases of giant-cell tumor. In the spine, complete destruction of one vertebral body is suggestive of myeloma. As in metastatic carcinoma, pathologic fracture may result from myeloma in the shaft of a long bone and the pathologic fracture may be the first evidence of the morbid process. In the greater number of cases, there is general involvement of most of the skeletal structures and there may be difficulty in dis-

tinguishing between myeloma and the osteoclastic form of metastatic carcinoma. The roentgenogram of the head offers the most conclusive evidence for differentiation.

The characteristics of the malignant tumor in bone are best exemplified by osteogenic sarcoma. Elevation of the periosteum just above the site of dissolution of the continuity of the cortical contour shadow, the denuding of the cortex over the region of tumefaction and the "promiscuous" character of the invasion of the surrounding soft tissue structures constitute an image that is all but pathognomonic. Roentgenographically this group can be subdivided into the various types: (1) subperiosteal and medullary; (2) periosteal; (3) sclerosing; (4) telangiectatic (bone aneurysm); (5) chondrosarcoma, and (6) atypical forms.

Sarcoma predominantly invades the metaphysis (the end of the diaphysis or shaft where it joins the epiphysis), whereas giant-cell tumor, often simulating it most closely, nearly always commences in the epiphysis. Sarcoma may involve the epiphysis by extension and giant-cell tumor may invade the diaphysis in a similar manner.

Subperiosteal or medullary sarcoma often requires careful technic to demonstrate. In one projection, evidence of the lesion may be so slight as to be missed. Another projection will reveal the break in the continuity of the cortex and the shadow of the tumefaction promiscuously invading that of the soft tissues.

The periosteal sarcoma is associated with a "sun-ray" of fine linear bony shadows radiating more or less at a right angle to the axis of the shaft. Here again it may be difficult to detect the defect in the cortex in one projection although in another the characteristic features of the lesion are very apparent.

The sclerosing sarcoma, as the name suggests, is associated with intense sclerosis of the involved portion of the bone. Particularly in the upper end of the tibia, this tumor may be difficult to distinguish from syphilitic osteitis; only careful study in one of perhaps several projections will reveal the break in the continuity of the cortex. The soft tissue invasion of this type of tumor may be so limited as to be difficult of recognition.

The telangiectatic sarcoma (bone aneurysm) is characterized by extensive bony proliferation which, in the femur for example, may very closely simulate a suppurative or other inflammatory synovial lesion.

Chondrosarcoma, because of its cartilaginous content, occasionally offers difficulty in detection of the characteristic demarcation of the normal from the subnormal in the cortical contour and lacks the definitely promiscuous features of invasion of the soft tissue.

Among the atypical forms, probably some of the most interesting are the tumors of the shaft of the femur. As before mentioned, the majority of osteogenic sarcomas involve the metaphysis, but a small proportion are seen in the diaphysis, well away from the epiphyseal junction.

These tumors of the shaft have all the characteristics of Ewing's tumor, a nonosteogenic tumor described as an endothelial myeloma or diffuse endothelioma, yet several of the most typical, roentgenographically, of our series of Ewing's tumors with elliptical widening of the shaft and multiple (onion skin) laminations in the cortex, proved on examination of microscopic sections to be osteogenic sarcomas, and failed to react favorably to radiotherapy.

The bulk of Ewing's tumor lies subperiosteally, the tumor infiltrates the bone and the bone reacts vigorously with ossification. In the same tumor, subperiosteal formations may be observed running parallel with the bone (onion skin laminations) and at right angles to the axis of the shaft. This miniature sun-ray effect may become exaggerated, resulting in an invasion of the soft tissues by a spicule formation atypical for osteogenic sarcoma or Ewing's tumor in both its roentgenographic image and its response to radiotherapy.

Ewing's tumor tends to involve the shaft of the long bones in the middle third, but it may involve any portion and frequently involves the metaphysis. In the shaft, the most constant feature is proliferation of the cortical region; the condition most often is confused with osteomyelitis. Careful observation will reveal that the medullary portion is not involved in Ewing's tumor. The value of this observation was demonstrated in one case recently observed in which the roentgenographic image of a lesion in the middle third of the tibia was typical of osteomyelitis; within seven months the patient had a periosteal sarcoma. When the tumor breaks through the cortex and invades the adjacent soft tissues, the silhouette of the invading portion is less distinctly demarcated than is that of the benign tumor, and yet lacks the promiscuous invasive character of the osteogenic sarcoma.

This lesion should not be confused with traumatic sclerosing osteitis or the infectious nonsuppurating osteomyelitis of Garre, as neither of these shows any tendency toward lamination of the expanding cortical shadow, but exhibits a homogeneous flat density throughout. The intact subperiosteal hematoma is usually more closely confined and more frequently projects from one aspect of the bone. The ruptured subperiosteal hematoma presents lines of ossification running parallel with the axis of the shaft, much coarser and more widely divided than the onion skin laminations of Ewing's tumor. Greenstick fracture with the formation of a region of callus may be difficult to distinguish from this malignant tumor.

The defense mechanism of the bone against the advance of this tumor is exactly similar to that of bone against the advance of a pyogenic infection, that is, the creation of a bony shell spoken of as an involucrum. An interesting fact is that Ewing's tumor reacts favorably to radiotherapy, efficient treatment by this method apparently stimulates this defense mechanism and results in marked accentuation of the outlines of the involucrum in the roentgenogram. In all cases of doubt, therefore, a safe procedure is to institute radiotherapy in moderate dosage and await results.

Malignant angioma has some of the roentgenographic characteristics of Ewing's tumor; intense subperiosteal proliferation of bony tissue occurs with a subsequent wide invasion of the soft tissues which has much the same faintly distinct outline as does that of Ewing's tumor. Under treatment with radiotherapy they respond somewhat, but not as favorably as Ewing's tumor.

Metastatic malignant tumors are the result of implants from malignant tumors in distant parts and have the histologic characteristics of the parents growth. Two distinct forms are recognized.

The osteoclastic (melting or melted ice) form is most frequently encountered secondary to carcinoma of the breast; it is the usual form which occurs secondary to carcinoma of the kidney and genito-urinary tract, suprarenal gland, thyroid gland, bronchus and lung, uterus or adnexa, and pancreas and biliary tract. Metastasis from carcinoma of the stomach is rare; when encountered it has a distinctive roentgenographic image tending toward an osteoplastic form. Occasionally, slow growing carcinoma of the breast will produce an image with some osteoplastic features. Localized lesions are seen in the osteoclastic form in which portions of one bone are completely destroyed; rarely, one of these presents the perfect example of a malignant tumor of bone with sudden dissolution of the cortical silhouette but, in the greater number of cases, the cortical shell persists or is gradually obliterated. Metastasis is seldom encountered below the level of the elbows or the knees in the extremities, but when it does occur it has a tendency to wipe out completely the whole or a greater portion of one of the bones, more frequently the radius in the forearm and the tibia in the leg. Lesions are seen in the proximal ends of the femur and humerus and pathologic fracture in these regions frequently may serve to call attention to the metastatic process and even to the presence elsewhere in the body of primary malignancy.

In the spinal column, the metastatic process may be confined to a single vertebral body and may almost obliterate all evidence of it or show extensive osteoclasts of a portion of the body. Compression of a vertebral body is noted in some cases, although extensive involvement may be apparent in one or several vertebral bodies with no evident alteration in their architecture. This suggests that pathologic fracture must be a factor in some of the deformities noted. At necropsy, vertebrae have been examined and proved to be so friable that the finger could be forced into the substance of the body and yet recognition of the lesion in the roentgenogram called for the closest scrutiny. Knowing this, it is justifiable to uphold a clinical diagnosis of metastasis in the spinal column even when it is impossible to identify the lesion in the roentgenogram. Localized lesions in the os innominatum, in the pubis and in the ischium vary from that of large regions of bony destruction, with margins conforming to the description of the malignant tumor in bone, to multiple punctate regions of varying size, or "melted ice" regions of varying dimensions.

Localized lesions may occur in the ribs; these are usually multiple regions scattered through several ribs. Frequently, in cases in which patients are of advanced age, with some general osteoporosis of bone and a diffuse fibrosis of the lung from chronic bronchitis or other cause, the superimposition of the pulmonary markings on the more translucent bone will give the impression of metastasis in the ribs. In such cases, reëxamination with heavier exposure and the interposition of the Bucky-Potter diaphragm often will reveal normal bone and obviate an error in diagnosis.

In generalized involvement of most of the structures of the skeleton, the bone generally will have a honey-combed appearance, varying widely in the dimension of the individual defects; punctate regions in some parts may be noted and there may be filling defects of varying size in other parts.

The osteoplastic form is almost always secondary to carcinoma of the prostate gland. The roentgenographic image of this form is that of a background of bony destruction with concomitant hyperplasia of bone tissue. The one process usually keeps pace with the other but, frequently there are variations in the degree of one or the other, with a resultant diversity of the image. In early cases, there is a small region of involvement in the inner margin of one or both ilia, under the overlapping wing of the sacrum. This easily may be misinterpreted as hypertrophic changes in the sacro-iliac joint. Frequently, the lesion will spread through the entire bony structure of one pelvic segment or involve isolated portions of one or both pelvic bones before attacking other parts of the skeleton. In other cases, the earliest roentgenographic evidence will be splotches of hyperplasia scattered over a background of apparently normal bone; these splotches will increase in size and number simultaneously with increasing evidence of bone destruction, until the entire bony structure of the pelvis and often the upper portions of the femurs are involved. The destruction and the proliferation may coincide to the extent that there may be a homogeneous eburation, often extending throughout the skeletal structure. In the spinal column, one vertebral body or several separate bodies will be involved; rarely this may be the only evidence of malignant metastatic involvement.

Recognition of metastatic involvement by roentgenographic examination may be the first intimation of carcinoma of the prostate.

The noninflammatory condition which simulates osteoplastic metastasis is osteitis deformans (Paget's disease). In some cases, this may offer considerable difficulty in differential diagnosis. Both conditions affect men who

are in the same period of life and both are frequently incidental findings in routine examinations.

Osteitis deformans, similarly to carcinomatous osteitis, may involve a single os innominatum before progressing to involve the whole skeletal structure; coincidental secondary anemia has been noted in cases of carcinomatous osteitis, as it has been in the apparently benign forms of sclerosing osteitis. It may be impossible to demonstrate carcinoma of the prostate gland by physical examination in some cases in which the roentgenographic evidence is almost pathognomonic.

In cases of benign osteitis, or osteitis deformans, the evidence of the trabecular elements is maintained or accentuated; in cases of carcinomatous osteitis, it is always obliterated in the cases that would offer difficulty in making a distinction. Associated with osteitis deformans, there is an enlargement of the shadow of the bone as a result of subperiosteal deposition of bony tissue; with carcinomatous osteitis, there is no enlargement of the bony shadow. In cases in which the femurs are involved, there is a widening of the cortex and bowing of the shaft in osteitis deformans; this feature is absent in cases of carcinomatous osteitis. Roentgenographic examination of the cranium and the tibias will reveal pathognomonic roentgenographic images if the lesion is osteitis deformans.

In this necessarily brief review, I have attempted to point out the salient characteristics of lesions involving bone that are recognizable by their roentgenographic image. This image furnishes the clue by which the majority of etiologic factors can be determined. Careful correlation of the roentgenographic, clinical and all other findings should be carried out in every case before the ultimate diagnosis is made and before the therapeutic measures to be used in the individual case are decided.

Surgical intervention always should be preceded by biopsy under control of a tourniquet, and the decision as to the procedure to be employed should await the results of microscopic examination of the tissues. Under such circumstances, the use of roentgen rays is of inestimable value; in fact, it can be said that roentgenology has become one of the indispensable methods in general diagnosis.

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Treatment of Gonorrhea With Sulfanilamide*

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IN December of 1936 there was no specific for gonorrhea. The program of the Venereal Disease Conference in Washington, had it been held a few months later, would have had to have much less of an apologetic attitude to those who were clamoring for a program against gonorrhea. Men such as Pelouze had to admit that the *science* of the treatment of gonorrhea had not progressed much in the forty years since Neisser discovered the gonococcus. "In the last analysis," he said, "we are embarked on a campaign of selling good conduct to the patient, and keeping it sold until he no longer has the disease. Gonorrhea control depended largely upon the nature of the doctor and patient contact."

In other words, this defeatist attitude had taken such hold that some workers went so far as to suggest withholding practically all therapeutics and substituting absolute rest. Some individuals through broad experience through the years, developed the *art*, which stood them in good stead where science had as yet failed.

At the conference, Nelson of Massachusetts said syphilis had already been dramatized and was ripe for attack and admitted it might be useless to bring gonorrhea much to the attention of the convention since there was no known drug or therapeutic measure which could be counted on to control the communicability of the infection.

The section indeed went so far as to recommend the widespread use of prophylactics, admitting their efficiency if quality could be standardized, and admitting also, incidentally, inability to be sure of control of the infection once it established itself.

No one denied the importance of gonorrhea as an epidemiological challenge. Its incidence was estimated to be about three times that of syphilis. It suffered by comparison with syphilis in that a few treatments did not control its communicability, neither was the individual rendered incapable of transferring it only because he remained under treatment.

However, in the next few months which followed the convention, the picture changed. Reports trickled out of a new method of treatment of gonorrhea. The first reports were colored almost unbelievably rosy. One of the faculty of the University of Minnesota was in the East. While there, he was, on account of illness, necessarily confined to the Johns Hopkins Hospital. What he heard and saw there convinced him and he in turn brought back reports to his colleagues. On the recommendation of one of those who talked with him, we began the use of sulfanilamide at the Workhouse and at the Special Clinic at Lymanhurst in the spring of 1937. A few weeks later, the first report of its use in gonorrhea appeared in the *Journal of the American Medical Association*.

*Presented before the Medical Staff of the Lymanhurst Health Center, Minneapolis, Minnesota, March 29, 1938.

in an article by Dees and Colston. They reported on a series of 19 cases treated at Johns Hopkins.

Since then, it has appeared that the drug itself was by no means new. It had been known to workers in Germany since 1908. For the past five or six years, interest had been renewed. Dr. Gerhard Domagk, working at the I. G. Farbenindustrie, had reported on the almost magical effects of the reddish solution of more or less secret formula, Prontosil, and its related tablets for oral ingestion, Prontylin. In 1934, Mr. and Mrs. J. Trefouel, working at the Pasteur Institute in Paris had progressed further and found that the life-saving effects ascribed to the mysterious drugs hidden behind proprietary names were in reality due to a simple white powder of formula generally known but long neglected: para-amino-benzene-sulfonamide, or sulfanilamide, by no means limited in its source to the sponsors of Prontosil.

In America, many remained skeptics. But Long and Bliss of Johns Hopkins travelled to London to see. There they met a young clinician, Ronald Hare, who had accidentally infected himself with streptococcus and had cured himself with the new remedy. From then on, scientific and authentic reports followed in quick succession. In a few months, even the whole rationale of gonorrhea treatment was metamorphosed. Centuries of treatment-attempt in gonorrhea had served only to circle back to more or less of a do-nothing attitude so that even a mature group of able clinicians were not ashamed to describe their treatment-attitude as one of "skillful neglect." Now it appears there may be added to the still-too-sparse list of specifics, a rediscovered drug which may prove at least a near-specific for gonorrhea also.

Recent current literature leaves little to add for those of us who are interested mostly in the clinical application of this new type remedy. Only an expression of interest in our experiences at Lymanhurst and at the Workhouse questionably justified this resumé of our observations.

METHOD OF ADMINISTRATION

Insofar as its application to gonorrhea is concerned, there seems to be no advantage in considering any but the oral administration in tablet form. We have as yet seen no case of gonorrhea nor reference to any, where intravenous administration was *imperative* because of gonorrheal emergency nor where there was justification for belief that intravenous administration would accomplish results where oral administration failed. It is expected that other than oral route may still be a necessary alternative where there is mechanical obstacle, where the intolerance is gastric only, or in children where prompt action may be called for. To date, in children (female), we have been placing reliance on suppositories of estrogenic substances.

DOSAGE

Varicus bases for dosage are in use:

1. Some are highly mathematical and attempt to

maintain certain concentration in the blood stream—10 mg. per hundred cc.

2. Others base dosage with eye to almost equal exactness—based on weight in kilograms.
3. Another method aims at high initial concentration which is admittedly desirable and necessary. This method advocates, in male of average size, 3 grams as initial dose. This high concentration is to be maintained by subsequent dosage of 1 gram every six hours.
4. Long and Bliss recommended 1 gram to every 20 pounds body weight daily. A 180-pound man would receive 9 grams or 144 grains daily. This high dosage is ordinarily tolerated in only three out of four and seems unnecessarily likely to invite complications due to accumulation crowding the average threshold of tolerance.
5. Some recommend combination of oral and intramuscular therapy. This method is supposed to have the advantage of maintaining the sulfanilamide level and assuring continuous therapeutic action. Average minimum for a course was 27.5 cc. of 5 per cent solution Prontosil intramuscularly, plus about 480 grains orally. This method is believed to minimize incidence of gastro-intestinal disturbance, by some considered due to local irritation of the gastric mucosa rather than to the toxic effects of the drug.
6. Our own dosage scheme is an adaptation and modification of the desirable features of several and is much more conservative than the above. It starts with initial maximum dose only little over 50 per cent of the dose recommended by Long and Bliss. Our table of dosage, which follows, is for average adults, and is subject only to downward revision, since we have never exceeded the maximum here given. Where underweight, smallness of stature, or asthenic appearance intrude the question, our judgment has been to decrease the dose to half or three-fourths the usual average.

No matter which of these treatment plans is used, one prerequisite is common to all: It is important to produce high concentration of the drug in the blood as soon as possible. When this has been accomplished, the dosage may then be reduced to just sufficient to maintain this concentration—as long as no symptoms of intolerance develop.

Absorption following oral ingestion is rapid, in fact, it is apt to be complete within five or six hours.

Maximum therapeutic effect may often be expected in as early as 48 to 72 hours. As soon as the more intense symptoms subside, the dosage is tapered down until certainty of cure, or intolerance, indicate withdrawal. It is usually advantageous to continue the treatment for a week or two even after the complete disappearance of symptoms. This added caution will do much to preclude the possibility of relapse.

Observations indicate broad latitude as to tolerance and expectation as to effect, so the dosage may be considered as elastic enough to permit modification conform-

ing to the severity and duration of the infection, as well as to the general condition of the patient.

Our dosage is based on the standard 5 grain tablet. Ingestion is advised following the three major meals and before bed. A so-called course is as follows:

4 tablets 4 times a day, 4 days, $16 \times 4 = 64$ tablets

3 tablets 4 times a day, 3 days, $12 \times 3 = 36$ tablets

2 tablets 4 times a day, 14 days, $8 \times 14 = 112$ tablets

Followed by

1 tablet 4 times a day, 7 days, $4 \times 7 = 28$ tablets

In some cases following a short interval, we have repeated this course. On the whole, tolerance has been remarkably high, considering the high potency of the remedy and its propensity to cause untoward effects upon certain functions and tissues, especially the blood corpuscles. In not over 5 per cent did the necessity of withdrawing the drug itself interfere with the accomplishing of cure. Neither does tolerance in general seem to go necessarily with robustness or appearance of general good health. Nor are there as yet known indices which could be relied upon to forecast intolerance. Clinical vigilance backed by laboratory checks where available, are indispensable if one is to forestall the more serious complications which may follow the earlier signs of intolerance.

Probability of dangerous prolonged self-medication should be eliminated by ordering the tablets in portions just large enough to suffice for each step in the descending dosage. This is especially necessary during the first week of intensive treatment, since it is during this period that most indications of intolerance appear.

It is likewise imperative to impress the patient with the importance of avoiding self-medication of any type during the period of sulfanilamide therapy. Indeed, the fact that it is a drug of many incompatibilities, must be borne in mind by the physician as well as the patient. The balance of tolerance is so sensitive, that it may be easily upset, even by such simple coincidental self-treatment attempts as are ordinarily thought of as innocent household remedies. Among the taboos requiring special emphasis are the saline cathartics with their sulphate radicals. These seem to invite the more serious blood dyscrasias, especially sulfhemoglobinemia.

MODE OF ACTION

Satisfactory explanation of the mechanism of the action of sulfanilamide is lacking. Colebrook, Buttle and O'Meara recognized the discrepancy between the marked therapeutic results obtained and the limited bactericidal activity observed. They suggested that the enhanced bactericidal action of the blood was supplemented by that of practically all of the other tissues of the body.

Increased phagocytosis has been advanced as an explanation. It is observed that the pus cells are unusually packed with gonococci. It is not known definitely that the pus cells are really stimulated. More weight is apparently given to the opinion that the drug acts by virtue of bacteriostatic action and that because of the power to attenuate certain bacteria, they are rendered more vulnerable to phagocytosis.

Marshall has shown that the drug is rapidly absorbed from the gastro-intestinal tract, enters practically all the body fluids, and is excreted rapidly and almost entirely by the urinary tract both in unchanged form and conjugated with an acetyl radical. Retention of the drug in the blood is therefore most liable to occur in cases of renal impairment.

In the course of the urethra itself, there is reason to believe that the excretion of the antiseptic is greatest in the tissues of the prostate and posterior urethra. Those who advance this idea do so because they claim that the action is most spectacular in chronic cases, and point out also that the second glass nearly always clears quite rapidly. They say that in the anterior urethra the excretion of sulfanilamide subsides as the inflammatory exudate subsides. This decrease in sulfanilamide concentration here sometimes runs ahead of the decrease in gonococci so that disappearance of the discharge does not always mean cure. It is for this reason that in the shreds and in the small amount of seemingly innocuous moisture which often persists with sulfanilamide treatment, gonococci may frequently still be found.

COMPLICATIONS DUE TO THE DRUG

(As described in the literature plus some additions from our own observations)

Among the lesser untoward symptoms definitely attributable to the drug are a number of manifestations prone to occur during the first week—the period of heavy dosage.

Consideration may first be given to certain phenomena which are almost to be expected and which, while they command attention, do not necessarily compel withdrawal of the drug.

Most common is a tendency to feeling of weakness and malaise. Headache and feeling of dizziness is likewise quite general. Many complain of anorexia and disturbed taste sensation. A considerable number also mention restlessness, insomnia and also disturbing dreams.

Another drug effect noted in about 35 per cent is a rather characteristic change in color—a type of *mild* pallid cyanosis. In a few there may be more extreme changes to either marked pallor or cyanosis.

Mild elevation of temperature is also not uncommon and at least 5 or 6 per cent develop higher fever with chills and profuse perspiration.

In considering the complications by systems, there may be considered first those referable to the skin:

SKIN

There seems to be a predilection for the face, neck, shoulders, pectoral regions, arms and forearms.

1. Most common is a diffuse erythematous rash—almost scarlatiniform. This may be considered to be analogous to a so-called toxic erythema.
2. Perhaps as a later stage of this same manifestation, there is also described a morbilliform eruption especially apt to affect the shoulders and arms.
3. In some there may be more livid rash resembling erysipelas. In these more marked cutaneous com-

plications, edema is apt to be a conspicuous factor—in some cases so intense that the facial appearance may be distorted, and the extremities, especially the upper arms, may reach a size practically twice that of normal. None of these cutaneous symptoms prove very formidable. All are usually relieved by simple local applications and disappear within a few days following withdrawal of the drug.

GASTRO-INTESTINAL

Anorexia and nausea have been mentioned above. In some few, the nausea increases till vomiting develops. In a few there may be constipation in subjects not previously troubled.

KIDNEYS

Urinary complications due to the medicament itself, are conspicuous by their absence.

Neither albuminuria nor glycosuria are apt to occur. There does seem to be a marked tendency to phosphaturia, clearing satisfactorily upon the addition of acetic acid.

One gross deviation noted in our own series was an almost constant tendency for the specimens to be more highly colored than normal. This is probably dependent both upon the dye-like properties imparting a reddish tinge to the urine and to concentration which is to be expected from the tendency to increased perspiration which was observed in many. It was necessary to advise increased ingestion of water not so much as a part of the treatment itself but to insure suitable two glass specimens through the course of the observations. Some observers even mention reddish staining of the linen, urinary in origin. This may be a special peculiarity of some of the preparations dependent upon their origin and mode of administration. It has not been observed by us during the oral administration of sulfanilamide itself.

BLOOD

Wherever facilities permit, red and white counts and probably hemoglobin estimates are admittedly desirable, but apparently not indispensable, if scrutiny is frequent and heed is given to the *general condition* more than to the local during the first week of intensive treatment. Anemia may occur and is apt to be of the aplastic type. Methemoglobinemia, leukopenia, and sulfhemoglobinemia have also been described; the latter may be invited by ingesting saline cathartics coincidentally.

ACIDOSIS

Southworth describes two cases of acidosis developing during treatment with sulfanilamide. According to his figures, many cases may be expected to show drop in the CO₂ combining power. Probably the departure from the figure given—7.4, is usually too little to be of clinical significance in *most* cases.

Probably with the thought of this complication in mind, it has been recommended that coincidentally with each dosage of sulfanilamide, a corresponding dose of sodium bicarbonate should be prescribed. This precau-

tion will probably be an effective measure in lowering the incidence of even the milder toxic drug effects.

In our own practice, we have not made this a routine, but are to date postponing the prescribing of the sodium bicarbonate to the subsequent visits and even then reserving it only for those manifesting any symptoms which could possibly suggest intolerance.

A case of toxic optic neuritis has been reported.

Mental confusion and a condition similar to that of alcoholic intoxication are also mentioned.

Depression of hepatic function is mentioned as is also abdominal discomfort.

Some of the rarer blood dyscrasias have been described.

Some atypical dermatoses not described above have also occurred and it is interesting to note that Menville and Archinard as well as others have pointed out that the toxicodermatoses due to sulfanilamide are particularly prone to occur on the parts of the body exposed to the sun.

Any of the complications mentioned, when present even in mild degree, indicate necessity for increased vigilance, but only the more serious ones make imperative the prompt withdrawal of the drug. In none of our own cases did any of the complications we saw last more than 48 to 72 hours following the cessation of sulfanilamide treatment.

We include in our report a series of 100 cases. These are not selected but represent practically all the cases definitely diagnosed since treatment of gonorrhea with sulfanilamide was instituted by us. The number embraces not only those at Lymanhurst, but also those at the men's Workhouse, the Women's Detention Home, and a small number in private practice also. Diagnosis was completed in all. In most instances, smears were first examined by one of us, diagnosed as gonorrhea and later confirmed by the Health Department laboratory. Incidentally, with regard to the question of limitation of this series to gonorrhea only, it does appear that the action of sulfanilamide in urethritis is highly selective for gonorrhea, since it seems to be only occasionally and questionably of value in non-specific urethritis.

Our most spectacular results both in females and males seemed to be as with the older treatment, at the Workhouse. Needless to say, there the success is probably in proportion to the control of hours and diet and remoteness of temptation and dissipation.

GONORRHEAL INFECTION IN THE MALE

In the males, our cases were as follows:

Number of cases	78
<i>Anterior Urethritis</i>	
Acute, duration up to 1 week	29
Sub-acute, duration to 6 weeks	7
Chronic, duration more than 6 weeks	24
<i>Posterior</i>	
Acute	3
Sub-acute	2
Chronic	9
<i>Prostatitis, (Abscess)</i>	1
<i>Epididymitis</i>	3

Of these 78 males, the greatest number, 58, were seen in the Special Clinic. Twelve were treated in private practice and eight in the Workhouse.

Of the 22 females, 14 were treated in the Special Clinic and 8 at the Workhouse.

GONORRHEAL INFECTION IN THE FEMALE

It has been most gratifying that in the female, the results have appeared to be almost as spectacular as in the male. In the small series in the Women's Detention Home, there did not seem to be a single failure. *Tolerance* in the female in the main was even better than in the male. Cessation of gross symptoms seemed to be accomplished in the same short time, sometimes in four or five days. Negativeness of smears was likewise promptly achieved.

Cervicitis:

For the most part, our cases in females have been that of cervicitis. Most of them happened to be sub-acute, and the results have been most conspicuous in that group where discharge was of recent origin and profuse.

Urethritis:

Two of the series had urethritis only and have also yielded completely and readily, the smears promptly becoming entirely negative and the urine normally clear.

Bartholinitis:

In two cases with Bartholin abscess, the results were equally striking. In one, a definite abscess, as large as a good sized walnut melted away in the course of a few days with no interference other than the sulfanilamide. In the other, following drainage through small incision at the first visit, healthy healing with complete obliteration of cavity and wound followed promptly with none of the cosmetic disadvantages seen in cases previously treated without sulfanilamide.

Tabulation of our cases shows the following:

RECAPITULATION

In the tabulation, we have 100 cases of various types of gonococcic infection of the genito-urinary tract in males and females; 78 were male, 22 were female.

In 68, cure, confirmed by the usual standards, was definite and complete—including satisfactory period of observation.

In the males, of 78 treated, 54, or 69 per cent, were discharged as definitely cured. No relapse was noted in any case where observation and tests had been deemed satisfactory enough to warrant closing our case as cured.

In addition to the 54 males whose cure was proven, there was an additional group of 12 tabulated as "Probably Cured." This group includes those who responded so favorably that all gross microscopical symptoms justified anticipation of cure, but who could not be counted as cured because of uncontrollable interruption of their attendance or observation. If their treatment and tests could have been completed, it is very likely that this whole number could have been added to the 54 listed as "cured." This would have brought the percentage of cure up to 84 per cent, which would have correspond-

Case No.	Stage when Sulfanilamide Treatment Instituted	Complications of Disease After Beginning Sulfanilamide	Drug Reactions	RESULTS			Comment
				None or Disease Progresses Under Treatment	Improvement Marked, Probably Cured in No. of Days	Discharged as Cured in No. of Days	
1SC	Acute Anterior	None	Nausea, fever, weakness		10	180	Mostly observation
2	Acute "	None	None		19	110	Mostly observation
3	Acute "	None	None		20	20	Probably cured
4	Acute "	None	Rash on arms		10	10	Probably cured
5	Acute "	None	None		10	165	Cure complete
6	Acute "	None	None		10	60	Cure complete
7	Acute "	None	None		2	44	Cure complete
8	Acute "	None	Malaise		14	42	Cure complete
9	Acute "	None	None		14	56	Cure complete
10	Acute "	None	None		14	64	Cure complete
11	Acute "	None	None		50	110	Cure complete
12	Acute "	None	None		11	48	Cure complete
13	Acute "	Increase in disch.	Rash on arms	Discharge Increased			Failure
14	Acute "	Increase in disch.	Rash on arms	Discharge Increased			Failure
15	Acute "	None	None		10		Probably cured
16	Acute "	None	Feverishness		17		Probably cured
17	Acute "	None	None		7	47	Cure complete
18PP	Acute "	None	None		16	27	Cure complete
19	Acute "	None	None		21	40	Cure complete
20	Acute "	None	None		14	75	Cure complete
21	Acute "	None	Pallor		62	87	Cure complete
22	Acute "	None	None		20	45	Cure complete
23	Acute "	None	None		None		Failure
24	Acute "	None	None		25	25	Cure complete
25	Acute "	None	None		12	45	Cure complete
26PP	Acute "	None	None		11	67	Cure complete
27	Acute "	None	None		9	10	Probably cured
28WH	Acute "	None	None		18	66	Cure complete
29	Acute "	None	Feverishness		16	32	Cure complete
30SC	Sub-acute "	None	None		30	130	Cure complete
31	Sub-acute "	None	None		14	90	Cure complete
32	Sub-acute "	None	Confusion, Weakness		7		Probably cured
33	Sub-acute "	None	None		18	18	Probably cured
34	Sub-acute "	None	None		21	21	Probably cured
35	Sub-acute "	None	Dizziness		30		Failure
36	Sub-acute "	None	Prostration		7		Failure
37SC	Chronic "	None	Fever		19	18	Cure complete
38	Chronic "	None	Prostration		9		
39	Chronic "	None	Tiredness		None	69	Cure complete
40	Chronic "	None	Malaise		9	69	Failure
	Chronic "	None	None				Cure complete
41	Chronic "	None	Malaise		9	120	Cure complete
42	Chronic "	None	None		60	240	Cure complete
43	Chronic "	None	None		10	240	Cure complete
44	Chronic "	None	None		25	70	Cure complete
45	Chronic "	None	Headache		9	60	Cure complete
46	Chronic "	None	None		9	240	Cure complete
47	Chronic "	Increase in disch.	None		None		Failure
48	Chronic "	None	Tiredness		9	35	Cure complete
49	Chronic "	None	None		60	75	Cure complete
50	Chronic "	None	Feverishness		None		Failure
51	Chronic "	None	None		9	95	Cure complete
52	Chronic "	None	None		30	100	Cure complete
53	Chronic "	None	None		9	75	Cure complete
54	Chronic "	None	None		9	150	Cure complete
55	Chronic "	None	None		9	150	Cure complete
56	Chronic "	None	None		9	23	Probable cure
57	Chronic "	None	None		40	180	Cure complete
58	Chronic "	None	None		15	120	Cure complete
59	Chronic "	None	None		14	150	Cure complete
60	Chronic "	Increase in disch.	Increase disch.		None		Failure
61	Acute Posterior	None	None		14	60	Cure complete
62	Acute "	None	None				Probable cure
63	Acute "	None	None		9		Probable cure
64	Sub-acute "	None	Pallor		60	90	Cure complete
65	Sub-acute "	None	None		23	65	Cure complete
66	Chronic "	None	None		5	90	Cure complete
67	Chronic "	None	None		40	45	Cure complete
68	Chronic "	None	None		10	100	Cure complete
69	Chronic "	None	None		20	65	Cure complete
70	Chronic "	None	None		28	50	Cure complete
71	Chronic "	None	None		50	120	Cure complete
72	Chronic "	None	High fever		15	18	Cure complete
73	Chronic "	None	Chills, fever		20	60	Probable cure
74	Chronic "	None	None		16	60	Cure complete
75	Prostatic abscess	None	Pallor		10	60	Cure complete

Case No.	Stage when Sulfanilamide Treatment Instituted	Complications of Disease After Beginning Sulfanilamide	Drug Reactions	RESULTS			Comment
				None or Disease Progresses Under Treatment	Improvement Marked, Probably Cured in No. of Days	Discharged as Cured in No. of Days	
76	Epididymitis	None	Weakness	Failure	25		Failure
77	Epididymitis	None	None	Failure			Failure
78	Epididymitis	None	None	Failure			Failure
79SC	Chronic Cervicitis	None	Chills, fever	Failure		200	Failure
80	Chronic "	None	None		14	200	Cure complete
81	Chronic "		None		22	90	Cure complete
82	Chronic "	None	None				Incomplete
83	Chronic "	None	Fever, nausea	Failure			Failure
84	Chronic "	Metrorrhagia	Metrorrhagia				Incomplete
85	Chronic "	None	Dizziness		43		Cure complete
86	Chronic "	Metrorrhagia	Metrorrhagia	Failure			Failure
87	Chronic "	None	None	Failure			Failure
88	Chronic "	None	None				Incomplete
89	Chronic "	None	None		55	60	Cure
90	Chronic "	None	None		18	60	Cure
91	Chronic "	None	None		30		Failure
92	Chronic "	None	None		14	35	Cure
93WH	Chronic "	None	None		7	30	Cure—Barth.
94	Chronic "	None	None		22	45	Cure—Barth.
95	Chronic "	None	None		19	60	Complete cure
96	Chronic "	None	None		14	25	Complete cure
97	Chronic "	None	None		19	21	Complete cure
98	Chronic "	None	None		25	30	Complete cure
99	Chronic "	None	None		18	60	Complete cure
100	Chronic "	None	None		12	21	Complete cure

ed more closely to the more favorable reports listed by others.

Results in most cases were prompt and striking, and in many cases were spectacular enough to cause not only surprise but question on the part of the patient, as to the diagnosis itself.

Decrease and subsequent disappearance of gross discharge followed institution of treatment in about five days in the male, and in the female, in about seven days. In fact, in the cases reacting favorably, most cures were really complete in the first two or three weeks. In most cases destined to go on to cure, they reached this goal with the first course of treatment, which course in most cases was considered to be 28 days, as per table above.

The average time for smears to become negative and persist negative in the cases tabulated "Cured" and "Probably Cured," in the male was 19 days, and in the female, 22 days. These figures do not give a really satisfactory picture because they include not only the acute anterior uncomplicated cases but also some chronic stubborn cases and also a few where gonococci persisted even in what appeared to be simply an innocuous mucus or moisture. The average time necessary in these chronic or complicated cases is often difficult to compute, but results were all that one could reasonably hope for, even in one case of prostatic abscess with urinary retention, and in another with perineal urethral fistula. Both of these went on to prompt cure with complete healing even of the fistula which had previously resisted other methods of treatment for months.

The average time before observation was considered complete in those cases discharged as "Cured" was, in the male 88 days, in the female 56 days. In the case of the days for observation also, the figure is really an over-estimate of the time really necessary, since our own interest in this new method of internal treatment caused

us to keep our patients reporting longer than is really essential.

In only three cases was there even the slightest progression of the infection itself after the institution of treatment with sulfanilamide. This must in itself be considered as quite impressive since with former treatment plans, progression to posterior urethritis with development of prostatitis, epididymitis, arthritis or other troublesome complications had to be feared in almost 50 per cent of all coming under treatment. In the three cases referred to, progression consisted of definitely increased discharge and irritation which subsided promptly upon withdrawal of the drug. No other complication of the disease itself set in after sulfanilamide treatment was begun.

In addition to the three cases aggravated by the sulfanilamide, nine others among the males and five of the twenty-two females showed no response and were added to the list of failures.

Of the twelve failures in males, the largest incidence of failure seemed to be in those who already had developed epididymitis before treatment could be instituted. Of this group, we had three; none of them were cured, neither were they helped more than could have been ordinarily expected with any other accepted method of treatment.

In the females, of the 22 treated, 14, or 63 per cent were discharged as definitely cured. This percentage is not far below that given for our results in males.

In five females, or in slightly more than 22 per cent, treatment with sulfanilamide proved ineffective. Of these five failures, treatment had to be discontinued in two because of menorrhagia, and in the other three because of other symptoms of marked intolerance.

In only one case, and this also in a young woman, was there reason to question permanence and complete-

ness of cure. She reappeared, about four months following her cure, with marked pelvic cellulitis of undetermined origin and etiology.

Adding to previous *general* comments on complications due to the drug itself, we believe a few figures and additional observations based on our own series are noteworthy, i. e.,

Certain *mild* drug effects are almost to be expected and were not considered marked enough to warrant tabulation. These include especially *slight* pallor and mild feeling of malaise.

However, in 12, weakness and prostration were marked enough to interfere with the continuation of the treatment and attendance.

Five developed varying degrees of dermatitis—mostly on the face, neck, shoulders and arms. All of these improved promptly on withdrawal of the drug.

Nine developed fever high enough to command attention. In four or five of this number, the fever was complicated by chills and marked prostration. In two, hospitalization was necessitated, and in one of the two, the symptoms were startlingly like those of lobar pneumonia.

Gross observation of our cases did not indicate that there was any type of person as to nationality, stature, or state of general health who could be expected to react less favorably than others. If there were any differences notable, it was rather dependent upon the tolerance to the drug itself. In this direction, patients of the healthy type showed much less evidence of intolerance, and were therefore naturally prone to manifest more favorable response.

COMPARISON WITH PREVIOUS METHODS

It is difficult to compare the results with those accomplished while using the older methods. There are many reasons for this difficulty.

1. Almost 50 per cent of the cases we see either at the Workhouse or at the clinic are usually of long duration, already complicated by extension to relatively inaccessible structures. On institution of the previous methods of therapeutics, there was always concomitant risk of aggravating complications. With sulfanilamide, some of the most spectacular results have been seen in the complicated posterior cases.

2. With the former methods, the duration of treatment was so long that in the Workhouse too large a fraction were handicapped by too short sentences, and in the clinic and in private practice, by no means all afflicted persevered. Even in those coming under treatment early, incidence of complications, especially posterior urethritis and epididymitis, was high.

3. In the older treatment programs, it was largely a matter of the disease running its own course; now that course may be so definitely shaped that long periods are no longer necessary to detect progress—changes may be counted in hours instead of days.

4. It was assumed that the unsatisfactory results with previous methods of treatment were familiar enough to eliminate necessity for control series, so this was omitted

and all patients coming under treatment were placed on sulfanilamide treatment. In some cases, certain local measures were added, mostly designed to encourage the frequent attendance necessary for satisfactory observation and supervision.

In our series and elsewhere, it has been observed that patients who do not react to sulfanilamide more or less promptly are apt not to react at all. It appears that these patients reach a stage where no further advance is made, and unfortunately if this occurs, their power of reaction to other drugs is likewise adversely affected. The dosage program should therefore be limited so as not to extend much beyond 28 days which has been mentioned as the period beyond which improvement grows increasingly unlikely. In our own schedule, we have adopted a course which extends over a period of 28 days. In some cases, however, after a short interval or so-called "rest-period," this course may to great advantage, be repeated.

Many reporting on their experience with sulfanilamide advocate various co-incidental local measures. In our own experience with this drug, it has appeared that whatever results follow depend wholly on the drug itself. We have to a great extent withheld or postponed measures other than those essential for successful follow-up. When it has appeared in some cases that we could no longer look for cure from the sulfanilamide treatment itself, we have resumed our former treatment practices.

ADVANTAGES

One of the greatest advantages of the treatment with sulfanilamide is the marked shortening of the period of discharge and positive smears with the resultant decrease in potential infectiousness.

There is elimination of the necessity for self-injection, so often the cause of complication and chronicity.

There is also no longer any excuse for early instrumentation which all too often defeated its own purpose.

Satisfactory results are conspicuous to the patient also so there is not the same temptation nor opportunity for delinquency.

Progression of infection after treatment is instituted is rare, in fact, with the exception of increase in discharge in three cases, progression of the disease while under treatment was not seen by us in any of the cases followed. With the older methods, the incidence of spread to the posterior urethra was so high that some observers stated one had to expect posterior extension involving the posterior urethra, prostate or epididymis in as high as 50 per cent, especially if the case was seen after the fifth day following onset.

With the treatment with sulfanilamide, results are often most gratifying in those posterior complicated cases admittedly so difficult of cure previously.

The promptness with which the infection is controlled confirms the bacteriostatic action, and the high incidence of complete cure proves the action to be bacteriocidal also.

Our criteria of cure were those usually accepted, i. e.:

1. Absence of discharge.
2. Examination of any secretion available including so-called normal moisture, "morning drop," and shreds.

3. Smears of above mentioned secretions to be checked by laboratory and by culture where doubtful.
4. Sparkling clearness of urine in glass 1 and 2.
5. Normal prostate with normal secretion on expression.
6. Absence of stricture as tested by sounds.

The prostate examination and sounds we regard as of value as provocative as well as for the information yielded by the test itself.

Another measure which has seemed to be of value as a provocative in our hands is the administration of tablets of sodium salicylate. Five or ten grains three times a day after meals will frequently seem to make the gonococci demonstrable in questionable cases.

As far as criteria of cure are concerned, we have seen no justification or necessity for instillations of strong silver nitrate, nor any virtue in the advice to drink or have sexual relations as a test.

In the Female

Long series of negative tests, usually ten or twelve, at intervals of two or three days. At least two or three of these should be at the end of or immediately following the menstrual period.

Special examination of urethra and available glands.

Pelvic examination.

Examination of urine.

Culture in the female in the clinic at Lymanhurst is routine before dismissing patient.

SUMMARY AND CONCLUSION

Sulfanilamide exhibits marked therapeutic effects in gonorrhea. Results are more promising than with those of any previous therapeutic measure advocated for the gonococcus.

Supplementary measures in most cases are unnecessary though mild injections, irrigations, and prostate massage are apt to be of some value.

Sulfanilamide must be considered a potent remedy with rather an uncertain threshold of safety. It should therefore be prescribed in relatively small quantities, usually just sufficing to bridge minimal gaps between medical observations. These gaps should rarely be longer than two intervening days, especially during the first week of heavy dosage.

Treatment with sulfanilamide is a rational office procedure with ambulatory gonorrheics.

Contrary to conclusions of some, our experience showed it to be equally valuable in acute cases and in females as well as in the chronic cases of gonorrhea. In a series of twelve unselected cases in males in our office, the treatment with sulfanilamide failed to bring about cure in only one, signifying, if this small series may be used, potential curability in 92 per cent of acute cases.

In cases of acute gonorrhea reacting favorably to sulfanilamide, cure may often be obtained in two or three weeks, which may be roughly considered as one-third of the time necessary with previous methods. With this more or less abortive method, however, the period of tests and observations is more important than ever and should not be shorter than thirty days additional whenever possible.

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The Needs of the Tuberculous*

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BECAUSE so many contributions have been made regarding certain specialized aspects of the problem of tuberculosis, it might be appropriate at this time to approach the problem in terms of the needs of the individual as a whole rather than in terms of the various separate services which may be rendered. What may be said of the needs of the tuberculous is also true of all other handicapped persons, with minor variations due to the type of treatment necessary and the duration of the disease.

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Certain facts must be born in mind in any discussion of tuberculosis:

First, the cause of the disease is known. Tuberculosis is due to the mycobacterium tuberculosis. This organism can be isolated, inoculated into laboratory animals, and cause disease again.

Second, the disease is contagious or infectious, and therefore is preventable.

Third, there is a specific test known, the intracutaneous tuberculin test, to detect tuberculous infection in an individual. An X-ray of the lungs gives some measure of the extent of disease in the pulmonary tissue.

Fourth, there is no known method of immunizing a person against tuberculosis. It is a truism to state, yet

this must necessarily be pointed out: that it is best not to get any infection, for if you do not become infected, you will not have the disease. If the tuberculin test becomes positive in an individual, there can be no assurance that disease will not follow, maybe several years later.

With these fundamental facts in mind, one can approach the question of the medical and social needs of the tuberculous individual and the problem of the development of a state or local program to meet these needs. It is not sufficient to plan for the medical needs alone as there are other aspects of the disease which must be considered at the same time. If special medical care is to be of maximum value, it is imperative that opportunity be provided for mental and physical development and adjustment. The mental and physical rehabilitation of the tuberculous is one of the most highly co-operative enterprises known to public health today. It requires a high degree of community effort.

Medical needs may be subdivided into three main categories: first, the early diagnosis of new cases of tuberculosis; second, provision for adequate sanatorium care by properly qualified personnel; and, third, adequate and continuous medical follow-up, particularly during the first five years after discharge from a sanatorium.

Finding cases of tuberculosis does not mean simply the identification of all known cases in the community. It means the diagnosis of tuberculosis soon after the development in a serious form in the body. It includes, also, the rediscovery of old cases of tuberculosis which are no longer under the medical supervision of the health authorities. This residue is a very significant reservoir of infection in the community.

The discovery of tuberculosis can be considered under two headings, the direct and the indirect methods.

1. *Direct Method:* In the direct method one must reach out into the suspect's own home. The investigation and examination of contacts of new cases and recently reported deaths by the epidemiologist of the State Board of Health are examples of this. Included, also, are the examinations of members of the family who bring patients to the sanatoria and of members of the household who come to visit patients at the sanatoria. From the studies of Downes in New York, Opie, McPhedran and Putnam in Philadelphia, Stewart, Gass and Gauld in Tennessee, it is observed that the incidence of serious tuberculosis is much higher in the members of the families in which there is a known case of tuberculosis than in other family groups where there are cases of quiescent or noninfective tuberculosis. It is logical to search for fire where smoke is seen.

The State Board of Health laboratory can be of value as a direct means of finding tuberculosis. The routine examination of sputum sent in for the diagnosis of pneumonia may bring to light several unsuspected cases of tuberculosis. The examination for tubercle bacilli of pleural exudates and other potentially tuberculous fluids sent into health laboratories may result also in the discovery of many otherwise unknown cases. It is essential to rediscover old cases of tuberculosis which have ceased

treatment and are no longer under medical supervision. This part of the work must not be overlooked if the other phases of the program are to be successful. It is essential to go into the homes, using epidemiologists, public health nurses, social or welfare workers, and any other qualified personnel, for the discovery of possible cases of tuberculosis among family groups where there are known cases or where recent deaths have occurred. When these patients will not come voluntarily to the out-patient clinics, one must go out after them.

It is true that out-patient clinics attached to sanatoria or hospitals do find some new cases, but these are usually referred by family physicians. The out-patient clinics are of more value as follow-up centers and as diagnostic consultation centers for the local doctors.

Coöperation with the family physician is very important in finding new cases. The family physician is usually the first one to see the tuberculous individual and the one to whom the tuberculous individual is returned after special treatment. If the family physician is conscious of the threat of tuberculosis and suspects every patient who comes into his office, he will uncover a surprisingly large number of tuberculous persons.

Following the diagnosis of two cases of tuberculous meningitis in a small Minnesota town of 350 people, and the attendant interest aroused in the extent of tuberculosis in the community, Drs. E. J. Simons and the author discovered 22 cases of reinfection-type tuberculosis in the following six months in this territory simply as a result of diligence in search for and examination of persons suspected of having tuberculosis. The family physician can be the greatest contributor of new cases if he will apply himself and use available public health methods.

The work of epidemiological investigation is usually carried on by the State Board of Health through its epidemiologists and public health nurses, but should be carried on by any qualified personnel if State Board of Health funds are not obtainable. It is essential, if you are going to find cases early, actually to go into the homes where the suspects are living.

Veterinarians have taught us a great lesson in the eradication of tuberculosis in cattle. Pasteurization of milk and the area-accrediting of herds have undoubtedly cut down the disease in man, especially the glandular and orthopedic types of tuberculosis in children. All of the 87 counties in Minnesota have been accredited for tuberculosis, which means that there is less than one-half of one per cent of tuberculous infection in the cattle in each county. This is an excellent record.

Less than three per cent of the 9,000 known crippled children in Minnesota on April 1, 1938, under 21 years of age were disabled by bone and joint tuberculosis. When this is compared with the incidence 30 years ago, when the hospitals for crippled children were practically filled with bone and joint tuberculosis, the striking decrease in the incidence of this type of the disease is remarkable.

It should be possible to have counties accredited for human tuberculosis as well as for bovine tuberculosis.

To begin with, it might be fair to set up as an accredited county one which has had no new case of tuberculosis discovered during the year and has no known active cases which are not isolated. The extension and improvement in the standards of this accrediting could eventually lead to the eradication of the disease. This is possible if all of the medical and social needs of the tuberculous are adequately met.

The field workers who actually go into the homes contribute another very important part to the program. It is possible for them to carry on a continuous campaign of public health education where it will do the most good. There is nothing more effective than the actual demonstration of good public health methods. When persons in the home can be shown that the amount of infection and disease is cut down by early discovery and by the removal of the source, there is real preventive medicine being practiced.

II. *Indirect Method*: The indirect method of discovering tuberculosis consists mainly of tuberculin testing various population groups where a careful study has shown cases are most likely to be found. The routine use of properly standardized and applied intracutaneous tuberculin tests, followed by accurate X-ray examination of the lungs, is one of the most exact techniques known to medicine for sorting out persons with potentially serious disease. To the best of medical knowledge the intracutaneous tuberculin test, if applied properly, is harmless, even if used in persons with tuberculosis. In a survey in Minnesota in 1935, the tuberculin test was applied to 15,000 inmates of state institutions and 3,000 employees. Many of this group had advanced disease. In spite of this, there were no deleterious effects from the application of the tuberculin test.

It is necessary to concentrate survey efforts among those people who are most likely to suffer from the disease. It is not possible, because of the limitation of funds, to test everybody in the entire population, so it is reasonable to assume those groups should be approached which are most likely to produce new cases and cases requiring supervision and treatment.

Industrial workers between the ages of 15 and 45 years are a very productive group in this respect. It is known that unskilled workers experience several times as high a mortality from tuberculosis as skilled workers and professional people. Efforts should be directed towards the examination of industrial workers, particularly in the age group mentioned.

According to Dauer, in certain parts of the United States higher mortality rates from tuberculosis are observed among the male members in age groups between 15 and 45. Where this information is available, efforts should be made to obtain examinations of these persons first and others later.

According to Whitney, of the National Tuberculosis Association, there is reason to believe that tuberculosis has an untoward effect upon women who are pregnant. Therefore, it seems wise to make a Mantoux test, as well as a Wassermann test, on every pregnant woman who comes to a prenatal clinic or a maternal hygiene clinic for examination. It is very easy to apply this test;

it can be made at the same time as the Wassermann examination for syphilis, and may result in early discovery of disease in the lungs.

Another very lucrative field is available among the inmates and employees of state institutions, and particularly the new admissions to the institutions for the mentally deficient as well as to the institutions for the incarceration of criminals.

The time has come when statistics regarding tuberculosis need not be sugar-coated when they are presented to the public. If the true picture is known, something can usually be done. In Minnesota, in 1936, out of approximately 3,000 commitments to 18 state institutions, 107 cases of reinfection type of tuberculosis were found, 3.5 per cent of the total. Of the total commitments, 48 per cent had positive Mantoux reactions. Of the group of positives, 12 per cent had first infection tuberculosis; 5 per cent, pleurisy; and 7 per cent, reinfection type tuberculosis. Remember, these persons did not come to the institutions for treatment of tuberculosis, but for entirely different reasons. The finding of tuberculosis was accidental in the majority of instances. These persons came from every type of home in all counties of the state. Think of the possible unknown spread of the disease if these cases had not been diagnosed and isolated. When this type of work can be extended to other population groups, then it can be said tuberculosis is being discovered early.

Here is a Mantoux survey that was really productive of results. In the group of 107 reinfection type cases, it is interesting to note the distribution of lesions according to the National Tuberculosis Association classification. Fifty-five per cent were minimal; 25 per cent, moderately advanced; and 20 per cent, far advanced. When this is compared with the distribution of lesions in patients admitted to sanatoria throughout the state during the same year, a striking contrast is noted. Only 13 per cent of the sanatoria cases were minimal; 29 per cent, moderately advanced; and 58 per cent, far advanced. It is possible to find tuberculosis early.

It is to be remembered that within a short period many of these persons committed to state institutions go back into their own communities on parole. For this reason it is necessary to arrest disease, if possible, before parole, and it is of value to be able to report to the State Department of Health the persons who do leave the institutions with tuberculosis so that they may be supervised in their local communities. Otherwise two things would happen: first, these patients would infect unnecessarily a number of inmates and employees in the state institutions; secondly, they would go back into their homes and continue to infect others and spread the disease in the community.

Everyone is familiar with the procedure of using Mantoux surveys in the school population. When only limited funds are available, however, special school groups should be selected for examination. This includes, first, the high school group and, secondly, the teachers and janitors taking care of children in these schools. The method of procedure, the necessity for proper preliminary work, and the need for follow-up

investigation of these cases, need not be mentioned because of their familiarity to public health workers.

However, there is one aspect of this part of the problem which might be mentioned. It is possible to obtain consent for application of the tuberculin test from only about 75 per cent of the parents. If public health and school authorities making the surveys will look up, in the records of known cases and deaths in the State Department of Health, the 25 per cent of the children who refuse to have the test, there will be quite a surprise in store for them as to the number of families known to have tuberculosis who refuse to have their children tested. If your state law permits the examination of persons suspected of having tuberculosis, it is possible to consider these children as suspects and to request their examination. If it is explained to the parents that it is much easier to have their children examined along with others, usually there will be no difficulty. Otherwise the parents must be informed that a special worker will be sent into the homes to test these children for tuberculosis. This is an important aspect of the technique in properly carrying out a successful school Mantoux survey.

Public health education should be looked upon as an effective means of developing both direct and indirect methods of discovery of tuberculosis. It is generally agreed that public health education is carried on most ably by well systematized private organizations with training and experience in this field. Official agencies rarely have sufficient funds to do this part of the work adequately. It is necessary to combat the forces of ignorance, poverty and inertia by continuous, forceful education, the cumulative effects of which are not easily measured by the usual yardsticks. There is an unfortunate lag in the extent of our medical knowledge and the application of it. Public health education can fill this gap by making communities demand facilities for the proper care of their sick. This is a real challenge to private health organizations.

Provision for the examination of infected persons is next in order after discovery so that proper recommendations for treatment can be made. X-ray of the lungs of positive reactors must become standard procedure. The X-rays must be readable and must be read by experts to be of maximum value. Whenever it is possible, if satisfactory to the roentgenologist, paper plates may be used to cut down the cost of this examination. After all, the X-ray of the chest is a screening method which is used to pick out the cases most likely to prove dangerous. One must not rely on X-ray examinations alone. There must be good medical practice, including careful histories, physical and laboratory examinations, with the final diagnosis based upon all of the findings and not upon the tuberculin test and X-ray alone.

There is need for definite machinery to make certain that the person who has been diagnosed as tuberculous is given sanatorium care as soon as possible by competent personnel in an approved institution. Intégration of forces is possible by real coöperation among the family physician, the nurse, the social or welfare worker, and

frequently interested citizens and neighbors in the community.

When the patient actually enters the hospital, his specific medical treatment begins. It will not be necessary to go into details of sanatorium care except to point out that perhaps the greatest benefit of sanatorium care is the isolation of the patient away from his family for the purpose of preventing spread of the disease. In addition, there is the important opportunity to arrest the disease and to provide physical restoration of the individual. It should not be forgotten that 90 per cent of the cases come into the sanatoria in Minnesota in an advanced stage of the disease; that 8 per cent stay in less than 30 days; only 20 per cent get successful pneumothorax and keep it long enough to be of benefit; and less than 10 per cent have thoracic surgery, and these cases are usually far advanced. Do not expect miracles from your sanatorium.

While the patient is in the sanatorium, in addition to his medical care he must have an opportunity for education and vocational guidance and, if possible, vocational training. It is true that certain patients will not benefit by such social treatment. However, when training is indicated it should be given. It is necessary for the patient to make a mental adjustment to his new way of living, and this is not simple for many of these individuals. To change his way of living in middle life, takes all the courage the average man can muster.

The period of greatest danger to the patient is the first five years after discharge from the sanatorium. What happens to discharged patients? In studies embracing the time period 1885 to 1935, life-table methods of analysis have been used on groups of persons discharged from sanatoria in England and in the United States. These studies show that during the first five years after discharge of a person with minimal tuberculosis, the risk of dying was approximately four times, the moderately advanced case 16 times, the far advanced case 40 times that of persons of similar age and sex of the general population from which these patients were drawn. Females with advanced disease were more severely affected during this period. The age, the stage of the disease, the duration of residence, were important factors. The stage of disease on admission was apparently more important than the fact that the patient had tuberculous antecedents. The excess mortality was highest during the first two years after discharge. The early cases did not suffer the high mortality of the advanced cases. The imperativeness of early diagnosis is again apparent.

From these statistics one significant conclusion can be drawn. There is urgent need for universal provision for adequate medical supervision of the tuberculous patient after discharge. This can be of maximum value only after adequate sanatorium care has been given for a long period of time. All facilities and personnel for follow-up must be used, including out-patient clinics, family physicians, nursing service, welfare workers and local community organizations interested in the handicapped.

In Minnesota at the present time an attempt is being made to provide a method of medical follow-up by

means of reference of cases from the sanatorium to the county welfare board. When funds are available, provision for medical supervision will be made before the patient is discharged from the sanatorium.

By systematic follow-up, the number of patients who break down after discharge can be decreased definitely, and those who break down can be rehospitalized for further treatment and isolation before too much damage has been done to their bodies or too much infection spread to other members of the family. When it is recalled that in one year about 25 per cent of the admissions to the sanatoria in Minnesota are readmissions, it is seen that there is opportunity for improvement. The number of costly, unnecessary deaths could be reduced, and additional tuberculous infection and disease in other members of the family could be avoided.

There is opportunity for public education regarding the value of the follow-up of patients discharged from sanatoria. This must be directed towards the patient himself and responsible public officials in the village, city, county, and state.

The rehabilitation of the tuberculous individual is closely related to follow-up work. It is not wise to provide vocational training and placement for a patient who is not making a satisfactory recovery. In other words, it is unwise to spend \$3,000 on a three-year training course for a patient who has 80 chances out of 100 of dying within two years. Such a patient should be protected and given the utmost care possible; but the money available for rehabilitation should be used for some person who is likely to live and to take his place in society in the future.

For certain cases it may be necessary temporarily to provide convalescent or boarding homes in local communities. It is cheaper to place patients in these homes than to keep them in expensive sanatorium beds. For certain types of domiciliary cases where no medical treatment is needed, merely supervision, it may be desirable to use poor-farms to take care of some of the arrested cases.

It seems logical to spend a certain amount of money for follow-up in order to insure the tremendous investment made to provide sanatorium care. Otherwise, much of the money spent for hospitalization is wasted. No one would carry on a private business in that way without soon becoming bankrupt.

There is need for continuous research into the basic causes of tuberculosis, and for careful inventory of the medical and public health responsibilities and methods of procedure. Frequent inventory must be taken to determine whether or not public health practices employed are effective in decreasing the number of new cases appearing each year. It is essential that the tools provided by medical and social statistical analysis be used if the program and services are to improve. This does not mean simply the compilation of an annual report. It means careful investigation into the basic causes of the disease.

One fact that is frequently lost sight of is that the social needs of the tuberculous must be met if the medical care that is given is to be of optimum value. After

the patient has left the sanatorium, he must have food, clothing, shelter and fuel, for himself and his family, and freedom from mental anxiety caused by want. It is true that this is not a medical problem, but it is inseparably involved in the whole picture and, therefore, must be faced, if in no other way than by attempting to obtain public assistance for these people in need of care.

It is difficult to enlighten some public officials as to the specific needs for aftercare of the tuberculous. These persons do not appreciate the necessity for careful supervision of these patients after discharge from the sanatorium. They are loathe to appropriate funds for such necessary care. Yet, until this is done it will not be possible to control and eventually eradicate the disease.

The majority of tuberculous individuals cannot undertake a regular occupation immediately after discharge; and for that reason, after leaving the sanatorium, they are dependent upon local resources for their sustenance until such time as they are able to and can obtain work. The local community will have to provide in some way for these people if they are without funds, and it would be wise to start that care immediately upon the return of the patient to the community so that the good effects of sanatorium care may be continued at home.

In Minnesota at the present time the State Board of Control is attempting to put into force a plan, which will be of value in the education of the local welfare groups and public officials, relative to the need of medical care of unfortunate persons in local communities who have contracted tuberculosis and who are unable to provide the funds for private medical care. In addition, this plan will help to educate the patients themselves as to the urgency for the proper care of their health, particularly for the practice of good personal hygiene, for their own protection as well as for that of other members of the family. None of the provisions in this plan sets up a new administrative unit or includes any special appropriation from state funds.

The method of procedure is as follows.

At least a month prior to the probable date of discharge of a tuberculous patient, the medical director of the sanatorium fills in a sanatorium reference report, which is then forwarded to the Board of Control, where the factual material regarding the status of the tuberculous individual will be reviewed and recorded for future medical analysis. The reference report will then be sent by the Division of Tuberculosis of the Board of Control directly to the county welfare board, which will investigate the patient, about to be discharged, as to eligibility for public aid. After careful investigation, the county welfare board will inform the medical director of the sanatorium as to the eligibility of the discharged tuberculous individual for public aid. Provision can be made, upon the discharged patient's return to the community, for his medical care and for public aid, dependent upon the funds available in the county and the eligibility of the patient.

Such a plan, if successfully operated, should result in a better standard of living for the discharged tuberculous patient, a decreased number of readmissions to the

sanatoria, and better results of sanatorium care at a decreased cost to the community and the state.

It must not be forgotten that during a major portion of the period of his care, recreation is needed for the tuberculous person precisely as for any other normal individual. Again the private agency can play a dominant part. The whole attitude of a worker with the tuberculous is to make that individual feel, so far as is possible within the limits of human skill, that he is like other people in the community.

A state program developed for the purpose of controlling and eventually eradicating tuberculosis must be built to meet the medical and social needs of the tuberculous individual, with the end in view of creating equal distribution of opportunities for health for all the tuberculous. It must be flexible, comprehensive, and yet practicable, within the limits of funds, facilities, and personnel available.

There is room for every public and private group sincerely interested in the health and welfare of the tuber-

culous. There must be coöperation between the various agencies and organizations in order to avoid duplication and to allow each group to do that part which it does best.

Public health education must be continuous and directed towards the needs of the tuberculous individual, not merely towards the betterment of the records of any particular organization. Family physicians must be increasingly integrated into the program if permanent success is to be obtained. As Dr. Jacobs says, it is imperative that community resources be organized, and that public health education focus public opinion on this problem if a great economic loss is to be prevented.

In conclusion, it should be repeated that every known method must be used to find early tuberculosis, to obtain sanatorium care soon after diagnosis, to give adequate sanatorium care, and to provide medical and social follow-up, if the tuberculous individual is to be rehabilitated physically and mentally and restored to capacity.

Pulmonary Embolism*

A Report of 54 Cases

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THE frequency with which pulmonary embolism is demonstrated postmortem in patients from the medical and surgical services of Trinity Hospital invites a more detailed study of this pathological finding. This report is based on the records of 457 postmortem examinations performed from the first of June, 1932, to the end of December, 1936. The number does not include autopsies of still-born infants or children dead in the first few weeks of life. Pulmonary emboli were described in 54 records, of which 37 were from medical and 17 from surgical patients. The incidence of pulmonary embolism was about 12 per cent, occurring more than twice as frequently in medical than in surgical patients. These findings are similar to those reported by T. H. Belt,¹ in 1934.

Several authors have recently stressed the importance of cardiovascular disease and cardiac decompensation in the etiology of antemortem venous blood clots. Sol Roy Rosenthal,³ in a statistical study of the incidence of venous thrombi and pulmonary embolism in the clinics of Central Europe and North America, found that embolism was observed with increased frequency in Europe after 1919. The increase coincided with the higher incidence of cardiac and vascular diseases and to a lesser extent with the increase in infections and suppurative processes noted in Europe after the War. During the same period there was no corresponding increase in pul-

monary embolism in the United States and Canada. In his review of 1,000 consecutive postmortem examinations at the Cook County Hospital,² he found that 63 per cent of 149 cases of cardiac decompensation and 44 per cent of 172 cases with advanced arterial disease were associated with venous thrombi. This is in sharp contrast to 511 patients with infections, of whom 17.4 per cent had antemortem thrombi in the veins.

Forty-seven of the fifty-six cases reported by Belt had evidence of impaired cardiac function. He regarded circulatory embarrassment as the most important single factor in the initiation of venous thrombi. Earl F. Henderson,⁴ in a report from the Mayo Clinic also emphasized the importance of cardiovascular disease in the etiology of pulmonary embolism.

Other factors generally mentioned in the etiology of antemortem thrombi are the age and weight of the patients. Embolism occurs infrequently before the age of forty, and as a rule in well nourished or obese individuals. Inflammatory lesions and chronic debilitating illnesses predispose to embolism. Surgical procedures precede most deaths which can be attributed entirely to massive emboli. Rosenthal,² and McCartney,⁵ found that pulmonary embolism occurred somewhat more frequently in males than in females in their reported cases. Changes in the chemical composition of the blood are considered as significant by most authors, although the exact nature of these changes is still unknown.

In the following review, particular attention is given

*From the Northwest Clinic and the Laboratory of Trinity Hospital, Minot, North Dakota. Presented at the North Dakota State Medical Association meeting at Bismarck, May 16-18, 1938.

to the condition of the cardiovascular system, but the other etiological factors have also been studied as far as the records permit. Only bland thrombi are considered in this paper. In 51 per cent of the cases, the emboli were associated with lung infarcts. Whenever pulmonary emboli were found, an effort was made to determine the site of origin of the thrombi. This was accomplished in a considerable number of cases, but the search was limited because extensive dissection of the veins of the extremities made proper embalming difficult and was not permitted.

The cases of pulmonary embolism may be arranged into two groups. In the first and largest are patients who entered the hospital on the medical service because of cardiovascular or cardiac disease, or because of some chronic debilitating illness. In the second group are deaths which occurred after operation and were associated with pulmonary embolism. One patient with fractures of the bones of the leg, who was not operated upon, is included in this group.

MEDICAL PATIENTS

There were thirty-seven patients in the medical group. Thirty-six were white and one colored. There were twenty-eight males and nine females. The preponderance of males over females is striking since only 62 per cent of the 457 postmortem records were of males. The ages of the patients ranged from 7 to 80 years, and the average age was 60.2 years. Only three of these individuals were 40 years of age or less, while thirty-four were more than 40. Six cases occurred between the ages of 41 and 50, eight cases between the ages of 51 and 60, thirteen between the ages of 61 and 70, and seven between the ages of 71 and 80.

Of the three patients 40 years of age or less, the youngest was a 7 year old cachectic male child who died after an illness of more than two months, caused by extensive infected burns of both legs. Both common iliac veins were occluded by firmly adherent blood clots and many branches of the pulmonary arteries were completely obstructed by thrombi. There were no lung infarcts. Each of two patients dying between the ages of 31 and 40 years had inactive rheumatic heart disease with cardiac decompensation.

A review of the clinical records of the medical group disclosed that twelve of the thirty-seven patients were definitely obese, eighteen were of normal weight, and only seven were emaciated. In twenty-six instances there were elevated white blood counts and some degree of fever during residence in the hospital. Fever and leukocytosis were present in four patients with recent myocardial infarcts, and in two who had inoperable carcinoma. In twelve there were obvious suppurative lesions. In the remaining eight instances the occurrence of fever and leukocytosis prior to lung infarction or hypostatic bronchopneumonia was not explained.

Because of the high average age (60.2 years) of this group of patients, it is not surprising to note a high incidence of cardiovascular disease. In only five of the thirty-seven cases were the hearts considered normal at postmortem examination. In twenty there was marked

arteriosclerosis of the coronary arteries of the heart. In seven of these there were large scars of the myocardium and in four of the seven, recent occluding thrombi in the coronary arteries were associated with myocardial infarcts. Other types of cardiovascular disease included one instance of luetic aortitis and five cases of old rheumatic deforming aortic and mitral valve lesions. Many hearts presented hypertrophy of the myocardium of the left ventricle. In twenty-five, where accurate heart weights were obtained, they ranged from 250 grams to 1120 grams, and the average weight for the group was 564 grams. There were twenty-three instances of cardiac decompensation as determined by postmortem examination.

There were ten patients with chronic debilitating illnesses, and of these only five had normal hearts. In four, death was due to heart failure.

There were only three sudden deaths due to massive pulmonary embolism in the entire group. One of these occurred in a 59 year old female, who entered the hospital because of hypertensive cardiovascular disease with cardiac decompensation and thrombophlebitis of the varicose veins of the right leg. At autopsy small emboli which had preceded the massive terminal embolus were found in the pulmonary arteries. The second patient, a 63 year old male, was admitted to the hospital because of syphilitic aortitis with marked aortic insufficiency and cardiac decompensation. The fatal massive embolism was preceded by smaller symptomless emboli, which were firmly adherent to the lining of the pulmonary arteries. The third was a 71 year old female with metastatic carcinoma of the body of the sixth thoracic vertebra and paraplegia resulting from compression of the spinal cord. Smaller emboli had not preceded the massive terminal embolus.

In twenty-one of the thirty-seven medical patients, lung infarcts were present and associated with small emboli. In nineteen of the twenty-one cases there was unmistakable postmortem evidence of cardiac decompensation. In fourteen of the twenty-one cases, there were two or more lung infarcts. Emboli and infarcts were found most frequently in the lower lobes of the lungs, and more often on the right than on the left side.

Venous thrombi which indicated a possible source of pulmonary emboli were discovered in twenty-six instances. Mural thrombi occurred in the right ventricle of the heart in two cases of coronary artery thrombosis, with infarction of the interventricular septum. Mural thrombi were also found in the right auricle of the heart in eight instances. The veins of the pelvis and lower extremities were involved six times, those of the pelvis alone four times, the renal veins twice, the hepatic veins once, the veins of the upper extremities twice, the left lateral sinus of the dura once. In those cases where a source of the emboli was not demonstrated the configuration of the thrombi suggested their origin in the veins of the pelvis and lower extremities. Most of the venous thrombi caused no local symptoms, and in only five cases were they recognized before death. In two patients there were huge thrombosed varicose veins of the legs on admission to the hospital. Other recognized sources of emboli were

thrombi in the left cubital vein, right subclavian vein, and veins of the left thigh in one instance each.

In twenty-one patients with pulmonary infarcts, clinical findings were sufficient to make a diagnosis in only eleven cases. Several of these were thought to be instances of bronchopneumonia before death. In the remaining ten patients pulmonary infarcts caused no symptoms and were only discovered at postmortem examination.

SURGICAL PATIENTS

There were seventeen patients who died following operation. Twelve were males and five females. Sixteen were white and one Chinese. The ages varied from 20 to 76 years, with an average age of 54.2 years. Thirteen were definitely obese, two of normal weight, and two emaciated. When the patients were arranged in age groups, pulmonary embolism occurred as follows:

11-20 years	1	41-50 years ..	1
21-30 years	0	51-60 years ..	7
31-40 years	3	61-70 years ..	3
71-80 years	2		

Twelve of the seventeen cases of pulmonary embolism occurred in patients more than 50 years of age.

There were four patients 40 years of age or less. The youngest was a 20 year old girl with a left pyelonephritis and a huge perirenal abscess, which was drained surgically. Thrombophlebitis of the left leg was associated with multiple pulmonary emboli and a large recent infarct in the lower lobe of the right lung. Sepsis was considered the primary cause of death. The cardiovascular system was normal.

Another of these patients was a moderately obese, 36 year old male who died suddenly of pulmonary embolism fifteen days after appendectomy for acute catarrhal appendicitis. Emboli which caused infarcts in the lower lobes of the lungs preceded the final fatal embolism. There was also present a retroperitoneal embryonal carcinoma secondary to a tumor in the left testis, which had been removed four and a half years before. The heart weight was 420 grams. An extensive polynuclear leukocytic infiltration of the myocardium was found on microscopic examination, and the etiology of this was not determined.

In nine cases there was either a marked hypertrophy of the myocardium of the left ventricle suggesting previous arterial hypertension, or serious coronary artery sclerosis, or both. There was one instance of acute myocarditis. In seven patients the heart was considered normal at postmortem examination. Lung infarcts were present in seven individuals, and in five of them there were pathological changes in the heart resulting from arterial hypertension and coronary artery sclerosis. Karsner,⁶ states that pulmonary infarction does not usually result from non-infected emboli unless there is a slowing of the blood flow through the lungs, such as occurs in chronic cardiovascular disease or local venous obstruction secondary to tumors or fluid in the chest.

There were thirteen patients who died suddenly of massive pulmonary embolism, and this group deserves special consideration. In six the heart weight ranged from 400 grams to 520 grams. In four others the

coronary arteries were markedly sclerotic, and there were extensive fibrous changes of the myocardium. In no case was there postmortem evidence of heart failure.

All of these thirteen patients were convalescing from operations involving the abdomen, pelvis, or abdominal wall. The operations included three appendectomies, a resection of a carcinoma of the rectum, a suprapubic cystotomy, a suprapubic prostatectomy, and a transurethral prostatic resection. There were three herniotomies, and three cholecystectomies.

Sudden death occurred from 2 to 111 days after operation, but there were eleven deaths in the first three postoperative weeks. Four patients died in the first week, one in the second week, and six in the third week. There was one death on the 46th and one on the 111th postoperative day. In five of these patients smaller emboli which caused lung infarcts, recognized clinically, preceded the final embolus.

The patient who died two days after operation was an obese 56 year old male with a gangrenous vermiform appendix and periappendiceal abscess. On admission to the hospital the left leg was edematous. The embolus was thought to have originated in the veins of this leg. The patient who died on the 111th postoperative day was a 55 year old male, with no evidence of cardiovascular disease, in whom a carcinoma of the rectum had been resected and a permanent colostomy made. He recovered uneventfully from his operation and returned to work. Autopsy demonstrated an extensive thrombotic occlusion of the left pelvic veins and a chronic cellulitis of the surrounding tissues. There was no evidence of metastatic carcinoma.

In six of the thirteen patients who died suddenly of pulmonary embolism, thrombi were discovered in the pelvic or leg veins. Clinically, two of the six had thrombophlebitis of the left leg. In the other seven patients of the group the blood clots became detached from the lining of the veins in their entirety and left no trace of their source. In two of these cases a marked edema of the left leg led the attending physicians to assume that the fatal emboli arose in the veins of the leg or pelvis on this side. The configuration of the blood clots in the pulmonary arteries supported this assumption. Hence in only four of the thirteen cases could intravenous antemortem blood clots have been recognized clinically.

In seven of the seventeen surgical patients extensive, acute, or chronic inflammatory lesions other than terminal bronchopneumonia were present at the time of death. Three of the seven had hypertensive cardiovascular disease with sclerosis of the coronary arteries, while in the others the hearts were normal.

Three of the seventeen patients had carcinoma, and in one of these acute myocarditis was discovered postmortem. In the other two the hearts were normal.

DISCUSSION

Consideration of the cases in the two groups just presented discloses a high incidence of pathological changes in the cardiovascular system in patients dying with pulmonary embolism. In forty-two of the fifty-four cases, there was evidence of such disease at the postmortem

examination, and in twenty-three death was caused by cardiac decompensation. Aschoff,⁷ emphasized the importance of slowing of the venous blood stream in the initiation of intravenous antemortem thrombi in heart failure. Such slowing in heart failure is most marked in the veins of the lower extremities where the thrombi are usually found. He regards injury of the blood vessel lining resulting from trauma, infection, circulating bacterial toxins, or poor nutrition as a further factor in the formation of antemortem blood clots. Changes in the composition of the blood which increase its coagulability are also important. He states that the combined effect of blood stasis with either injury of the blood vessel lining or increased coagulability of the blood is to favor the formation of abnormal thrombi. More recently Belt has stressed the importance of cardiovascular disease with consequent slowing of the venous blood stream in the etiology of the venous thrombi and pulmonary embolism.

Many authors state that stasis in the femoral and pelvic veins may result from the relative immobilization of the legs in bed or from the use of tight abdominal binders after laparotomy. These factors along with changes in the coagulability of the blood after operation such as have been reported by E. V. Allen,⁸ may have been of considerable importance in the surgical cases reported in this paper since cardiovascular disease with gross evidence of cardiac decompensation was found only in the medical patients. However, the heart changes in the surgical cases were such as to suggest that in most instances cardiac reserve was considerably diminished. The incidence of serious cardiovascular disease in the surgical group was about 58 per cent as compared with 86 per cent for the medical group.

Pulmonary embolism occurred with greatest frequency in patients more than 40 years of age. Forty-seven of the fifty-four patients were in this age group. Twenty-five were definitely obese, twenty of normal weight, and only nine of less than normal weight. Serious inflammatory lesions were present in at least nineteen cases, and in eight others there were evidences of infection not easily explained at postmortem examination. Chronic debilitating illnesses other than cardiovascular disease were noted in fourteen instances.

Most antemortem intravenous thrombi caused no striking local symptoms. Signs sufficient to permit a clinical diagnosis occurred in only eleven cases, although in many others abnormal blood clots had been suspected and carefully searched for by physicians before death. Postmortem they were found in thirty-six of the fifty-four patients, and in nineteen they occurred in the veins of the legs and pelvis. In twelve the configuration of the thrombi indicated that they had originated in the pelvis and large leg veins, although these blood vessels contained no antemortem thrombi.

In at least nineteen cases repeated pulmonary em-

bolism had occurred. In each instance lung infarcts were found. In only sixteen of the twenty-eight patients with lung infarcts were there symptoms or physical findings which would have led one to suspect this complication before death.

Fatal massive pulmonary embolism occurred in only three or 8 per cent of the medical patients. In the surgical group it occurred in thirteen, or 76 per cent of the cases. Thus, while pulmonary embolism occurred more frequently in medical than in surgical patients, fatal pulmonary embolism was characteristically a surgical complication. The highly dangerous, loosely anchored thrombi in the surgical patients were more likely to become completely detached than the comparatively firmly fixed blood clots in the medical cases. In seven, or 43 per cent of the sixteen patients dying of massive pulmonary embolism, thrombi were demonstrated in the pelvic or peripheral veins. This is considerably less than in the patients of the medical group where a possible source of emboli was demonstrated in 70 per cent. In seven of the sixteen patients dead of massive embolism, smaller emboli had preceded the final embolus.

Summary

Fifty-four instances of pulmonary embolism occurring in a series of 457 postmortem examinations in the laboratory of Trinity Hospital are reported.

Pulmonary embolism occurred more frequently in medical than in surgical patients, although massive pulmonary embolism causing sudden death was predominantly a surgical complication.

The incidence of advanced cardiac or cardiovascular disease was high in both medical and surgical patients dying with pulmonary embolism.

Pulmonary emboli occurred most frequently in individuals more than 40 years of age, who were of normal or greater than normal weight.

Serious inflammatory lesions were present in 35 per cent of these individuals, and occurred with approximately equal frequency in both medical and surgical patients.

Chronic debilitating illnesses other than cardiovascular disease were noted in 25 per cent, and both groups were about equally affected.

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Discussion of "Pulmonary Embolism" by Paul J. Breslich, M.D.

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It has indeed been a pleasure to listen to Dr. Breslich's paper, "Pulmonary Embolism." The manner in which

he has handled the subject leaves little, if anything, to be added. The pulmonary embolus in the medical case,

either as an incidental finding, or as the mode of exit of the patient, probably happens undiagnosed more often than we realize. Just how much might be done in this type of case in the way of prevention is still problematical, varying with the circumstances.

But to those of us doing a bit of surgery right along, there is nothing which knocks some of the ego from us quite like the sudden exit—along about the eighth or tenth day—in a patient apparently convalescing very satisfactorily. I know we have all had more than one such case; (with that 60 year old prostatic resection or the overworked mother of ten children convalescing from some intrapelvic surgery.) What do we dread more than that phone call from the hospital on the afternoon that the patient first sat up, to apprise us that he has a terrible pain in his chest, cold clammy perspiration, cyanosis, and an imperceptible pulse.

Too prone are we to pass it up as an entirely unpreventable accident. Certainly we should practice what little we do know of therapeutic prophylaxis against this

terrible sequela. If we did, I am sure that the mortality would materially decrease. I believe that this prophylaxis would not only help prevent a formation of the thrombi that may become potential pulmonary emboli; but would also be a step in the prevention of the coronary thrombosis we occasionally see postoperatively. Certainly if we can secure an improvement in the general circulation, coronary circulation will be improved more or less in proportion.

However, I believe that one of the most important parts of Dr. Breslich's work was in bringing the subject to us today in such a well organized manner, to wake us up, and to set us thinking about the problem. Certainly we recognize the cases that are cause for apprehension; we may try a few preventive measures there. If these measures of prevention are a good thing for the poor surgical risk, why not try them for the patient whose general condition appears to be first class?

Thank you for a most excellent paper, Dr. Breslich; it was most instructive and appropriate.

Obstetric Syphilis*

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THE recently developed nation-wide campaign against syphilis has encouraged a renewed interest in the detection, prevention and adequate treatment of all forms of the disease. This enlightened, lay point of view is demanding that the profession coöperate to the fullest extent in the campaign to control this scourge. In fact, in certain progressive states, legislation has been enacted to compel professional participation on a wide scale. Laws demanding serologic tests before marriage as well as in every pregnant woman have been passed and have met with wide public approval.

It has been estimated that there are 550,000 new cases of syphilis in the United States each year, with the infection slightly more common in men than in women. Roughly 10 per cent of all new cases are congenital, or hereditary, in origin. Assuming that there are two and one quarter million births annually in the country, it is obvious that approximately 2.5 per cent of the newborn children have the disease. In South Dakota, in 1935, among 13,192 births, there were approximately 330 congenitally syphilitic children, the vast majority of whom could have been protected by an adequate program of prenatal supervision.

The incidence of syphilis among pregnant women is generally that of the adult female population, and according to published statistics varies from 3 to 23 per cent according to the type of patient and the environment. The disease is more prevalent in the colored race than in whites, and in urban than in rural residents.

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In agricultural states, such as South Dakota, it probably ranges between 2.5 and 4.0 per cent. Parous women, by reason of their increased age and sexual experience, are more frequently infected than are nulligravidae.

The disease is characteristically milder in women than in men, and the evidence of infection may be so slight as to attract little attention. The primary lesion is usually hidden in the vagina or on the cervix and may pass unnoticed, while the secondary manifestations may be very mild and transient. When syphilis is contracted at or shortly after conception, the primaries and secondaries are frequently entirely absent or extremely mild and of short duration. Consequently, it is commonly impossible to obtain a history of the disease, and even suggestive physical findings are rare. The disease quickly becomes "latent" and can be detected only by serologic tests.

The interpretation of serologic tests is the same in pregnant as in non-pregnant women. A strongly positive reaction most probably means that the individual has syphilis, since with modern technic "false positives" are very uncommon. On the other hand, "false negatives" may run as high as 10 per cent, and, in clinically suspicious cases, should not deter the physician from offering treatment. When a positive test is reported, it is usually advisable, because of the chance of clerical errors, to have it repeated before intensive therapy is begun.

Syphilis has relatively little effect upon pregnancy, except that it may lead to premature labor because of placental changes incident to the action of the spirochetes on the vessels of the placental villi in producing an endarteritis. The older idea that syphilis produces

early abortion is scarcely tenable, since the proportion of early spontaneous interruptions of pregnancy is no higher than in non-infected women, and since the causative organisms have never been detected in a fetus of less than 16 weeks development. Abortions may occur in women who have syphilis but can be explained on other grounds. It is also now generally agreed that syphilis in itself is rarely, if ever, a cause of sterility. Not infrequently, gonorrhea is contracted together with syphilis and produces infertility by its familiar effect upon the internal genitalia, while, in other instances, the sterility is due to factors having no relation to the syphilitic infection.

The effect of maternal syphilis upon the fetus depends largely upon the time relationship between the initial infection and the conception. When the syphilis has been acquired some years before the beginning of the gestation and is in the "latent" phase, the fetus may escape, its chance for coming to term uninfected being increased as the interval is prolonged. Infections acquired shortly before, at, or within four months after conception are almost invariably transmitted to the fetus; while after the fourth month of pregnancy the probability again becomes smaller as term is approached. Although the general trends, as indicated, are statistically evident, it is quite impossible in any given patient to determine in advance whether transplacental transmission will occur. Consequently, it is obvious that every pregnant woman with syphilis must be treated if an honest attempt is made to control the congenital form of the disease.

Certain older concepts based upon purely clinical observations have been revised since the advent of the specific serologic tests. Colles' Law, which stated that an apparently healthy mother of a syphilitic child can not acquire syphilis through contact with her child, and which was the basis for the doctrine of paternal infection, has been discarded. These women are now recognized as having "latent" syphilis and so are immune to a new infection. Profeta's Law that apparently healthy children of syphilitic mothers do not develop syphilis through contact with their mothers is likewise discredited, since these children can be shown to have serologic syphilis in spite of their healthy appearance. In fact, there is no proof of an immunity to this disease; only those who have spirochetes lurking somewhere in the body are truly non-susceptible. This position leads inevitably to the conclusion that the only proof of real cure lies in the development of reinfectibility, a situation which is met very infrequently.

Depending upon the various factors involved, the child of a syphilitic mother may or may not be infected. In the more gross intra-uterine infections, the fetus succumbs in utero and is expelled, usually in the last trimester, while in other instances, it dies shortly after birth. When the child is born alive and survives the first few days, the problem of determining whether or not it is syphilitic presents many difficulties and occasionally cannot be answered at once. The cord-blood serologic tests are generally held to be of little value, since there are far more than the usual number of both false positive and false negative reactions. Some few authors

still insist that a strongly positive test means syphilis of the child, but the majority of observers deny even this and prefer to place no reliance on such evidence. When the tests are not strongly positive, there is general agreement that the results are of little or no value. In contrast to this equivocal position of the cord-blood tests, pediatricians insist that the serologic reactions are more specific at the age of 6 to 10 weeks than at any other period, and recommend that, in doubtful cases, the tests be done at that age.

Formerly it was thought that certain gross and histologic changes in the placenta were pathognomonic of syphilis, but recent investigators have indicated their conviction that the fibrous changes in the villi and the endarteritis of the chorionic vessels may be due to other conditions than syphilis. Spirochetes are found only with difficulty in the placenta, even when there has been a gross infection of the fetus, but in some cases may be detected in scrapings from the intima of the fresh cord vessels by the dark-field technic. In any event, the large, non-edematous placenta should arouse suspicion of the disease, particularly when the mother is known to have syphilis.

The older, classical physical findings indicative of congenital syphilis are rarely observed at birth, but when present are of great importance. The "old-man" appearance, skin eruptions of the pemphigoid type on the soles and palms, mucous patches in the mouth and on the lips, persistent coryza, and enlargement of the liver and spleen are most significant. It should be remembered that the liver is proportionately very large at birth and consequently can usually be palpated well below the rib margin.

Probably the most useful single diagnostic procedure is radiography of the long bones, particularly those in the extremities. These roentgenologic changes, which are considered pathognomonic, consist of an intensification and widening of the shadow at the epiphyseal line or, in some instances, of a doubling of the line. The epiphyseal border of the shadow may be irregular and jagged.

It is well established that incomplete treatment of the mother may alter the placental and osseous manifestations, a fact which renders negative findings of doubtful value. Some authors claim that as few as three intravenous injections of neoarsphenamine will serve to eliminate these evidences of congenital syphilis, although they are not truly curative.

When the child is born dead or dies after birth, pathologic examination should be undertaken whenever possible. The detection of pneumonia alba and of hypertrophic cirrhoses of the liver, spleen, and pancreas points to congenital syphilis, while the demonstration of Wegner's bone disease in the epiphyseal portions of the long bones is viewed as pathognomonic. With suitable histologic technic it is also usually possible to demonstrate great numbers of spirochetes in the various organs, especially the adrenals, liver, and lungs.

Every pregnant woman should be subjected routinely to a serologic test for syphilis. Most states are now providing free laboratory work of this character so that

the physician's participation in such a prevention program consists only in drawing the blood sample and forwarding it to the laboratory. Intensive therapy should be instituted (1) in all women with positive serologic reactions, (2) in all women with histories of treated syphilis irrespective of the serologic reaction at the time and (3) in certain women with an obstetric history suggesting syphilis, even though the serologic tests and physical findings are negative.

Treatment is dictated by considerations for the well-being of both mother and child. Pregnancy itself has a beneficial effect upon maternal syphilis and consequently antiluetic therapy is frequently more effective than in the non-pregnant. In pre-Wassermann days it was recognized clinically (Kassowitz' Law) that repeated and frequent child bearing might "wear out" a syphilitic infection to the point where later children would be born alive at term and would present no immediate evidence of the disease. Experimental work with rabbits has offered confirmatory evidence. The mechanism behind this effect is poorly understood, but the fact itself augments the arguments favoring the treatment of all syphilitic pregnant women.

The value of treatment in protecting the child of a syphilitic mother depends largely upon the period of pregnancy when therapy is begun. If modern, intensive treatment can be instituted before the middle of gestation, 90 to 95 per cent of the children will be uninfected, while starting therapy later reduces the possibility of good results. However, this latter observation is not a valid argument against giving treatment when the patient is first seen or the diagnosis is first made even in the last month of pregnancy. In such cases, the fetus is most probably infected, and there is no good reason for waiting until after birth to treat the congenital syphilis, especially when intra-uterine treatment is conceded to be more effective than that given after birth. Moreover, treatment given during pregnancy is often especially effective, and, in occasional instances, as few as three to five intravenous injections of neoarsphenamine may lead to a permanently negative serologic reaction.

Not only are the beneficial effects of antiluetic treatment augmented during pregnancy, but apparently the dangers are also somewhat increased, so that the risk

of arsenical hepatitis, dermatitis, and encephalitis is greater than usual. These serious, and sometimes fatal, sequelae more commonly appear during the first course of arsenical injections, and may presumably be reduced by decreasing the dosage and increasing the interval between treatments. It is also advisable, particularly in the last trimester of pregnancy, to examine the urine frequently for albumin, and to discontinue treatment temporarily if this abnormal constituent appears.

The explanation of the increased beneficial, as well as the augmented risk of detrimental, effects of arsenical injections during gestation is not clear, but may lie in the observation that the placenta stores injected arsenic and presumably gives it up slowly to the fetal and maternal blood streams.

Treatment should be begun as early in pregnancy as possible and should be continued until delivery, unless complications demand its cessation. It is usually recommended that neoarsphenamine, or some similar arsenical, be given once weekly for six weeks, followed by a similar course of mercury or bismuth, and then by a second course of arsenic, and so on. It is also quite essential that treatment be continued after delivery until the recognized complete dosage has been administered (40 doses of arsenic and 40 of bismuth, over a period of approximately 18 months).

When the newborn child definitely has syphilis, treatment should be started at once, using mercury and chalk by mouth and later employing one of the arsenicals and bismuth. In suspicious cases, where the diagnosis cannot be made from available data, some pediatricists advise waiting until the child is six to ten weeks old and then deciding upon therapy according to the results of the serologic tests, while others argue that it is reasonable to give treatment to all children from syphilitic mothers.

Syphilis in pregnant women presents problems of both curative and preventive medicine, which constitute a challenge to the medical profession. Any attempt at intelligent prenatal care demands routine serologic examination of the maternal blood, and intensive treatment whenever a positive reaction is obtained. By the pursuit of such a plan, considerable adult syphilis undoubtedly can be cured and the vast majority of congenital syphilis can be prevented.

Seventh Annual Report of the

Tuberculosis Committee, American Student Health Association

THIS is the seventh annual report of the Tuberculosis Committee, and covers the work accomplished during the calendar year of 1937, together with statistics concerning tuberculosis case-finding in colleges and universities during the academic year ending in June, 1937.

Since the effort of the Committee is divided into three

related parts, the report will attempt to present the results achieved in each of these directions.

I. *"To formulate a suitable program for tuberculosis case-finding and control among college students":*

Under this head we have to report that the publication known as a *Program for Tuberculosis in College Students*, originally submitted by the Committee at the

Thirteenth Annual Meeting of the American Student Health Association in 1932, and available since that date in mimeographed form, has been completely revised and brought up-to-date. It was presented by Dr. Lee H. Ferguson at the Second National Conference on College Hygiene, Washington, D. C., December, 1936. It now appears as the section titled *Tuberculosis* in the Proceedings of the Conference, pages 78-88. Copies of the book are available through the secretary of the Conference, 50 West 50th Street, New York City, at \$1.00 each. A somewhat abridged, mimeographed version may be obtained from the National Tuberculosis Association, at the same address, or from the chairman of this Committee. In either its longer and better form, or in its briefer presentation, it will be found full of practical suggestions for the college interested in establishing or strengthening a system of modern tuberculosis diagnosis and prevention.

II. *"Through the sectional groups of the American Student Health Association to stimulate interest in tuberculosis, and to bring about the adoption of definite programs for its control":*

The activities to be reported under this section must be expanded to include more than merely those connected with regional student health meetings, practically all of which saw at least one paper devoted to student-age tuberculosis presented. Many of these were delivered by members of the Committee, by officers of the American Student Health Association, or by specialists in the field of tuberculosis. We must draw attention, however, to other addresses made before medical groups, at the 33rd annual meeting of the National Tuberculosis Association, and during the 4th annual College Hygiene luncheon under the sponsorship of this Committee as part of the N. T. A. meeting. The luncheon, now an annual fixture, was held at the Schroeder Hotel, Milwaukee, Wisconsin, June 2nd, 1937, and was attended by a capacity crowd that listened with great interest and profit to Dr. Lee H. Ferguson's splendid presentation of "A Five-Year Review of Tuberculosis in College Students."

This summarized the efforts of this Committee under the able chairmanship of Dr. Ferguson from its formation in 1931, sketched the progress made, and ended with constructive advice looking toward the future. It has since been published in the October, 1937, issue of *The American Review of Tuberculosis*.

Another high point of the year was marked by the already-mentioned Second National Conference on College Hygiene, held at Washington, D. C., December 28-31, 1936. The round table discussions and other sessions on tuberculosis were presided over by Dr. Ferguson, and several fine reports and papers were presented on various aspects of the college tuberculosis problem by close to a dozen speakers of national standing. The meetings of the Tuberculosis Committee were well-attended, and much interest and enthusiasm demonstrated.

Space does not permit other than brief acknowledgment of addresses made in the same cause in various

parts of the country during 1936-37, but it is hoped that some way may be found of preparing a helpful bibliography, once every two or three years of papers that have found their way into the journals. We frequently have requests for such a list, and should appreciate the help of anyone knowing of items to be included.

It is a matter of pleasure for the other members of the Committee to draw attention to the election of one of its number, Dr. J. A. Myers, to the office of president of the National Tuberculosis Association for this year—a well-merited honor.

Negotiations have been under way for some months to place a speaker on the program of the Association of American Colleges, meeting in Chicago in January, 1938. The annual meeting of the Association is attended by most of the college presidents of the country, together with the deans of undergraduate colleges. It was considered that a brief talk before this body would be a much more impressive and personal way of presenting the tuberculosis problem to college administrators than through the medium of correspondence as heretofore. Unfortunately, the program for this year proved to be complete. So interested are the members of this year's Executive Committee, however, that they have voluntarily asked us to provide a short article on the subject for the May, 1938, issue of their *Bulletin*, which Dr. Myers has kindly consented to prepare. Furthermore, the present officers have promised to bring to the attention of the incoming Executives the advisability and timeliness of setting aside one session of the 1939 meeting for a discussion of student health problems, of which tuberculosis would be one. We sincerely hope that this may be arranged.

III. *"To collect annual statistics on the incidence of tuberculosis and the results of tuberculin testing in college students":*

Before the figures for the school year of 1936-37 are presented, we wish to acknowledge the assistance so cheerfully granted the Committee this year by the National Tuberculosis Association. From the start there has always existed the warmest friendship and coöperation between the two bodies, but this year in particular the N. T. A. has performed a service of inestimable value to all who are actively concerned with the study of tuberculosis in college students. During the Milwaukee meeting an arrangement was made with the N. T. A. through its managing director, Dr. Kendall Emerson, whereby the Association undertook to send out to several hundred institutions the letters, questionnaires and other forms prepared by this Committee, to receive and tabulate the returns, to mimeograph and furnish, on request, the abridged copies of the *Outline*, and to aid with secretarial help in the year's campaign. It has been an enormous piece of work, and the heartfelt thanks of the Tuberculosis Committee, and especially of its chairman, go to Dr. Emerson, Miss Louise Strachan, Miss Jessamine Whitney, Miss Marian Nelson and all other friends in the New York offices of the N. T. A. who combined to put over what has unquestionably been the most ambitious effort on the part of the Committee

up to date. The activities of the Committee have already reached a stage where it is virtually impossible for anyone selected as chairman to carry on the campaign without outside assistance, in point of time, staff and expense. So long as the American Student Health Association remains financially a comparatively poor organization, the importance of such aid as that forthcoming from the N. T. A. cannot be too highly stressed or too deeply appreciated. With this year's experiences as guides it is now apparent where we should concentrate our effort in the future, without nearly so heavy a program necessary to accomplish comparable results. We hope that some such reciprocal agreement as that in effect this year may be given further trial.

We wish to congratulate Dr. C. E. Shepard, of Stanford, and Dr. H. S. Diehl, of Minnesota, upon their fine contribution to the sum of information available on tuberculous infection and concerning tuberculosis and student health programs in effect at colleges and universities throughout the country. Working through the American Youth Commission, they devoted several months to an exhaustive survey of health services, or the lack of them, accumulating a mass of data that will prove invaluable. It has already been reported in part, and no doubt will be the source of further communications.

Returning to our own report, Table 1 shows that literature went to a total of 819 colleges and universities, all but one being in the United States. From 233, or 28.4% of these schools completed questionnaires or informal replies recounting the status of tuberculosis at each were received. These figures are very encouraging, especially when it is known that practically every institution reporting no program or lack of a satisfactory program requested help toward the improvement of its health set-up. A few additional replies have been received too late to be included in the present survey, but it is probable that the bulk of those not yet heard from have little or no student health service, and therefore may not be expected to possess facilities for carrying on

a tuberculosis finding endeavor. This group represents a challenge to the Committee and to its parent Association, and we hope that we shall be able to follow up this year's contacts with repeated offers to assist all colleges in beginning their assault upon the problem.

The campaign this autumn was planned to begin early, with follow-up measures that it was hoped would succeed in bringing in the annual replies sooner than usual. Due to illness among the assisting staff some delays occurred, but in general the response from colleges has been highly gratifying, and the prompt and intelligent coöperation shown us has made it possible to prepare statistics on a scale never before attainable. Whereas last year's report utilized tuberculin testing figures from 28 schools, this year we have been able to include those from 85 institutions.

Shortly after the re-opening of school, a letter was sent out detailing the problem of student tuberculosis and inviting queries from all interested in weapons with which to combat it. The hope and ultimate goal of the Committee—a more or less uniform method of tuberculosis record keeping at member schools—was expressed, and its obvious advantages related. A sheet was enclosed, that among other information, summarized the various data that, in the opinion of National Tuberculosis Association's statistical experts, should ideally be accumulated from any college's health records. Along with this went a specimen student record card, and a tally blank, which, if used in the proposed or a conveniently modified form, would simplify the filing of individual, sex and institutional data. Where this card has been tried it has resulted in decreased rather than increased need for extra clerical help to compile facts regarding tuberculin testing, X-raying and other items in a modern program.

The preliminary letter was followed by the annual routine questionnaire of the Committee, also accompanied by an explanatory letter. With the help of experts this questionnaire was kept as simple as anyone could wish, but was expanded by the inclusion of two or three questions whose answers were calculated to illuminate the report we now present.

In the case of most schools this completed the circularizing, but to a carefully selected few there went a more detailed questionnaire, prepared as a result of further conference with authorities experienced in collecting tuberculosis statistics. The questions asked were in keeping with what they considered we should be able to obtain factually from institutions already known to possess well-established and probably superior types of tuberculosis programs. It was carefully made clear to those confronted by this final, more involved questionnaire, that we naturally did not expect many schools to be prepared yet for detailed breaking down of their data for 1936-37. We asked for as much or as little additional information as they might be able to supply. The replies thus far received, nineteen in number, while not what we had hoped for, are far from disappointing. They prove to us that we have asked some health services to do something their present and recent facilities will not permit.

TABLE 1.
Questionnaires Sent out to Colleges and Universities and
Replies Received, Autumn, 1937:

Sent		Received		Sent		Received	
Alabama	13	3	Nebraska	17	6		
Arizona	3	1	Nevada	1	0		
Arkansas	11	2	New Hampshire	5	1		
California	32	12	New Jersey	17	5		
Colorado	9	2	New Mexico	4	2		
Connecticut	8	5	New York	53	13		
Delaware	1	0	North Carolina	22	6		
D. of Columbia	10	1	North Dakota	9	4		
Florida	7	2	Ohio	48	19		
Georgia	15	2	Oklahoma	16	6		
Idaho	0	0	Oregon	11	4		
Illinois	41	14	Pennsylvania	68	15		
Indiana	23	5	Rhode Island	4	1		
Iowa	24	7	South Carolina	16	3		
Kansas	21	9	South Dakota	8	3		
Kentucky	15	4	Tennessee	25	2		
Louisiana	10	0	Texas	32	7		
Maine	7	1	Utah	4	2		
Maryland	15	5	Vermont	6	1		
Massachusetts	35	11	Virginia	19	5		
Michigan	22	3	Washington	11	3		
Minnesota	21	9	West Virginia	14	3		
Mississippi	10	3	Wisconsin	23	12		
Missouri	25	3	Wyoming	1	1		
Montana	6	1	Canada	1	1		
Total Questionnaires sent out				819			
Total Replies received				233			

Several colleges were able, however, to supply accurate, well-assembled figures (Table 6), while from others emanated such comments as: "We know we have not been keeping good statistics, but we plan changes in our record system that will enable us to keep track of our tuberculin testing, X-rays and other items according to age, sex and findings." In view of this experience, the Committee wishes to explain that it may be counted upon to give leadership to any movement to improve records and other means toward achieving our common ends, but we hope to witness the desired results come about gradually enough to guarantee their soundness and reliability. We have decided, therefore, that for the present the routine questionnaire shall remain the basis of annual statistics, and that we shall introduce modifications in its form at a rate calculated to stimulate interest and improvement at cooperating colleges. We shall certainly not cease trying, and we hope that each year will see an increasing number of schools able to provide more detailed facts concerning the evolution of their tuberculosis programs.

Significant facts apparent from a study of Table 2 begin with the almost universal acceptance of the Mantoux intradermal technique by those doing tuberculin testing. It is also observed that the Purified Protein Derivative (Long and Seibert) of tuberculin is steadily gaining favor.

TABLE 2.

Details of Tuberculin Testing, X-Ray Procedure, Etc., in Institutions Reporting Some Testing in Progress

No. of Colleges Reporting	91
Routine Method Employed:	
Mantoux Intradermal	80
Not Specified	11
Type of Tuberculin Used:	
Purified Protein Derivative	47
Old Tuberculin	40
Not Specified	4
Number of Tests, Routinely:	
Single Small Dose	44 (e)
Two Doses (or Single Large Dose—2 schools)	42 (e)
Not Specified	6
Groups Tested:	
Students—	
New Students only	42
Previously Negative Reactors	17
"All Students" (?)	8
Limited or Special Student Groups (a)	24
Non-students—	
College Food Handlers	30
Faculty or Other Groups (b)	29
Groups X-Rayed:	
All Students (eligible under the program)	5
Positive Reactors once only (c)	51
Positive Reactors at least annually	18
No X-ray provided or required (d)	13
Not Specified	4

- (a) Included: Student groups such as "Seniors," "New medical students," "First and fourth year medical students," "Classes in Bacteriology," etc.
 (b) Included: Groups such as "Faculty," "Faculty children," "Servants," "Employees," etc.
 (c) Several colleges in this classification indicated annual or periodic X-ray of some positive reactors, e. g. "those with suspicious findings at first X-ray."
 (d) Several colleges in this classification indicated that an X-ray is not part of the college follow-up program, though positive reactors are "advised" to secure a chest X-ray.
 (e) One university tried both methods in 1936-37, each on one-half those tested.

good, standardized preparation of O. T. will assure quite reliable results, and is especially recommended to those schools where enrollment is small, testing done in very small groups during the year, or where funds are not sufficient to justify using the more expensive P. P. D. It is hoped that as time passes the price of the more desirable P. P. D. may decline to a level that will allow it to become standard testing material for all.

It is notable that more schools are holding to a single dose method of testing than to a two-dose procedure. One university that last year tested one-half its new students with Dose No. 1, P. P. D., and the other half with the customary two doses as required, reports a positivity of 17.7% by the former as contrasted with 30.6% by the latter method. This controlled experience seems borne out by the results in various parts of the country at schools using one or other method, as tabulated in Table 3. Although both P. P. D. and O. T. were concerned in the two-dose results shown, and more usually a single dose of O. T. in the one-dose results, the two-dose procedure is seen to increase considerably the total of positive reactors found—30.5% as contrasted with 22.7%. It would be enlightening to discover what percentage of positive X-ray findings arises in the group of positive reactors identified by the second dose. If a single dose, using a minute amount of tuberculin, fails to reveal anything like all the tuberculosis present—and we are sure this is a valid observation—it is a very serious mistake for colleges to pursue such a policy, just as it has been found a poor short-cut to employ a single large dose without the preliminary small one, because of the greater number of sore arms and severe reactions apt to occur. Even though it costs more money and means more work, we urge that the undoubtedly more reliable double dose technique remain the procedure until such time as a proved reliable single dose method has been developed, if it ever is. In the meantime, to convince ourselves, perhaps we might watch carefully to see which group of positive reactors, those found with the first or with the second strength tuberculin, provides

TABLE 3.

Tuberculin Testing—Two-Dose versus One-Dose Method

Section	Sectional Results					
	Two-Dose Results (a)			One-Dose Results		
	No. of Colleges	No. of Students Tested	% Positive	No. of Colleges	No. of Students Tested	% Positive
New England States	5	2,252	51.7	2	446	39.4
Middle Atlantic States	10	2,796	43.4	5	952	35.4
Southern Atlantic States	3	990	33.0	4	5,432	24.3
States of the Mississippi Basin	15 (b)	17,846	26.5	28 (b)	13,849	20.4
Plateau and Pacific Coast States	9	9,397	28.9	5	2,264	24.6
United States as a Whole	42	33,281	30.5	44	22,943	22.7

This Committee has for some years advocated the use of P. P. D., due to a belief in its higher potency and lessened tendency to non-specific reactions. As in former reports, however, it is once more pointed out that any

B. Contrasting Results of Various Methods Employed in Institutions in the States of the Mississippi Basin

Method	No. of Colleges	No. of Students Tested	No. of Students Positive	% Positive
O. T. Single Dose not exceeding 0.1 mg.	23	10,099	2,101	20.7
P. P. D. Single Dose, 0.00002 mg.	5	3,750	724	19.3
O. T. Two Doses, Reaching 1.0 mg.	2	6,325	1,705	26.9
P. P. D. Two Doses, Reaching 0.005 mg.	13	11,521	3,034	26.3

(a) Includes O. T. reaching dosage of 1.0 mg. or P. P. D. reaching 0.005 mg.

(b) One university, using both methods experimentally, appears in both columns.

the relatively greater amount of pathology. In our opinion the quantitative allergic response bears little or no relationship to what the X-ray will disclose. We need the preliminary small dose to protect the very allergic individual from unnecessarily severe reactions; we need the second dose to find the rest of the infected students.

Another point of great interest to all concerned with public health as it is administered through student health agencies, lies in the revelation that slightly less than one-third of the schools with tuberculosis programs are attempting to examine food handlers, while an even smaller fraction extends the investigation to other employees and to faculty groups. That this is a serious omission should be apparent, as it seems rather pointless for us to devote so much time and energy to finding tuberculosis among students, only to allow them to be fed, waited upon and taught by people whose health may be open to the same or greater question.

The total enrollment (Table 4) at the 233 institutions answering the questionnaire was just under 400,000 students, and of these a little better than three-quarters were reported under some form of health service. Only 41 schools failed to report health coverage, 19 definitely stating that they had none, while 22 others failed to mention any. Of the remaining schools, a total of 91 support a tuberculin testing program, and of these, 85 provided statistics that were satisfactory enough to be included in this study. At these 85 institutions there were enrolled 213,698 students, of whom 56,224 were tested in 1936-37. Even allowing for former positives not retested, and admitting that some schools with no

TABLE 4.

Analysis of Reports on Tuberculin Testing and Tuberculosis in College Students During the School Year Ending June, 1937

Number and Size of Institutions Returning Questionnaire	233
Enrollment:	
Less than 500 students	78
500 to 999 students	66
1000 to 1999 students	37
2000 to 2999 students	12
3000 to 3999 students	4
4000 to 4999 students	8
5000 students and over	20
Enrollment not reported	8
Total Student Enrollment	399,628
Students Reported under Health Service	309,724 (a)

Tuberculin Testing:

Colleges reporting no tuberculin testing	142 (b)
Colleges reporting some tuberculin testing	91
No. reports satisfactory for this study	85 (c)

Total Students

Number tested	56,224 (d)
Number positive	15,385
% positive	27.3% (e)

Men Students:

Number tested	27,107
Number positive	7,981
% positive	29.4% (e)

Women Students:

Number tested	21,974
Number positive	5,457
% positive	24.8% (e)

(a) Number obtained from 153 schedules. Remaining 80, either no Health Service or information lacking.

(b) Thirteen of these colleges report routine X-ray of all students or of some part of student body, e. g. entering students, freshman and seniors, medics, etc.

(c) Data incomplete for six colleges in one or more details.

(d) Total includes 7,143 individuals not classified according to sex.

(e) Percentages not entirely reliable, since both single-dose and two-dose tuberculin results are included. (See Table 3.)

tuberculin testing do X-ray some or all of their students, it is obvious that a very low percentage of students attending the colleges cooperating in this year's report actually came under the kind of tuberculosis program the Committee has outlined as basic. In the light of the above, and with the realization that there are well over a million college students in the United States, probably not one student in ten or fifteen in this country is yet reached by a satisfactory tuberculosis-finding effort. This must bring home to us the fact that the fight has only begun.

Of the 56,224 students tuberculin tested, there were 15,385, or 27.3% who reacted positively, and as in previous years the men showed a higher incidence of infection (29.4%) than the women (24.8%). Compared with the figures from the past several years, as shown in Table 5, it will be noted that there has been apparently a rather sharp drop in percentages that have varied but little up till now. The natural question arises, why? It is impossible to account for the apparent decline until future surveys have a chance to indicate future trends, though we may hazard a few guesses. First, the tendency at some large institutions has been toward a lessening number of positive reactors for some years. Second, the number of schools reporting this year is about three times that of last year, and includes relatively more of those colleges not on the two coastal margins of the nation where tuberculin positives run high. We must also give credit to the general steady

TABLE 5.
Tuberculin Testing Results, 1932-1937

Year	Total No. Tested (x)	% Positive	% Men Positive	% Women Positive
1932-33	14,318	35.0%	35.0%	27.0%
1933-34	25,184	30.3%	30.0%	26.0%
1934-35	26,861	29.4%	30.0%	27.8%
1935-36	31,601	30.0%	31.0%	28.0%
1936-37	56,224	27.3%	29.4%	24.8%

(x) Annually some colleges fail to report positive reactors by sex, hence the percentages of positives by sex are computed on slightly smaller groups than the total tested would indicate.

decline in tuberculosis throughout the country and the effective program of eradicating tuberculosis from the nation's dairy herds that the veterinarians have carried through. The increasing use of P. P. D. as a testing agent, particularly at larger institutions, may be eliminating some of the questionable positives formerly reported.

The usual geographical differences in the amount of tuberculous infection persist (Table 3), with Eastern and Far-Western states leading, while Mid-Western, Central and Southern areas show rates lower than older, more densely populated, more heavily foreign-settled districts. The progressive incidence observable with advancing age is demonstrated in Table 6.

TABLE 6.
Incidence of Positivity to Tuberculin by Ages (x)

Ages (y)	No. Tested	No. Positive	% Positive
16	166	29	17.4%
17	1,295	252	19.4%
18	4,560	913	20.0%
19	2,795	644	23.0%
20	1,851	469	25.3%
21	1,308	375	28.6%
22	749	246	32.8%
23	449	163	36.3%
24	292	113	38.7%
25	159	68	42.7%
26 to 30	456	229	50.2%
31 to 35	153	98	64.0%
Over 35	131	96	73.2%
Total	14,364	3,695	25.7%

(x) Compiled from data submitted by 11 of 19 institutions replying to Special Questionnaire.

(y) Includes both sexes.

Colleges reporting cases of tuberculosis have been divided into three classes, as in Table 7. In the first group are 24 schools that do *not* routinely X-ray or tuberculin test. By clinical examination backed by X-ray of the chest *where considered necessary*, these colleges discovered a total of 20 cases of active tuberculosis, 15 men and 5 women. They also turned up 64 cases diagnosed as arrested tuberculosis. The enrollment in these schools totalled 70,812.

The second group is composed of 13 institutions that X-ray their students without a preliminary tuberculin test. With an enrollment of 20,758, these schools discovered 40 cases of active tuberculosis, 26 in males and 14 in females, as well as 106 cases of the disease considered clinically arrested. This is a splendid showing, and demonstrates what can be accomplished in colleges where the case-finding program is effectively directed at *all* the students.

In the third group, tuberculin testing was done on *some* or *all* of the students, depending on the local situation. The enrollment in the 61 colleges and universities included was 184,337. These schools, although we

TABLE 7.
Cases of Tuberculosis Among College Students, 1936-37

	Colleges Reporting NEITHER Tuberculin Testing nor Routine Chest X-Rays	Colleges Reporting Program of ROUTINE Chest X-Rays (a)	Colleges Reporting Program of SOME Tuberculin Testing (b)
No. of Colleges	24	13	61
Total Enrollment	70,812	20,758	184,337
Pulmonary Tuberculosis Diagnosed by all Methods:	84	146	564
1. Cases Reported as Clinically Active:			
Total	20	40	214
Men	15	26	125
Women	5	14	87
Not Specified			2
2. Cases Reported as Clinically Arrested:			
Total	64 (d)	106 (d)	350
Men	34	80	238
Women	30	26	112
Other Forms of Tubercu- losis Diagnosed (c)	0	1	14

(a) The vast majority of these students receive at least one chest X-ray while at college; many receive two or more.

(b) A large (at present not ascertainable) number of these students are not yet reached by the tuberculin testing being done in their respective schools; some tested are not X-rayed.

(c) Includes tuberculosis of skin, lymph nodes, bone, peritoneum, kidneys, genitals, etc.

(d) It is not definitely indicated that such cases were checked with a tuberculin test.

realize they did not have *all* their students actually under a tuberculosis screening process, did manage to find 214 active cases and 350 arrested cases.

The figures for the active cases alone reveal that among a student mass but partially covered by tuberculin testing, four times as much active tuberculosis was diagnosed per thousand enrollment as was found in a large group receiving neither routine testing nor routine roentgenograms, while in a group provided with excellent facilities for routine chest X-rays of all concerned, there was discovered almost seven times as much active disease per thousand as among the less fortunate untested, un-radiographed body. This would seem to be a decisive answer to the question asked by some correspondents as to whether a modern tuberculosis case-finding program is worth the bother and the expense. It may also provide food for thought for those who report "no cases of tuberculosis have been found at this school for many years," or "we do these tests and order an X-ray for any student *having symptoms!*" (The italics and the exclamation point are ours.)

It will be noted that we have omitted figures for the so-called childhood infection cases. This is simply because we believe every positive tuberculin reactor represents a case of tuberculous infection and of potential disease, no matter if the lesion be gross enough to locate on the X-ray films or not. It is obvious, therefore, that we believe the tuberculin test should be the *first* step in finding all those with tuberculosis.

Table 7 may occasion comment that although 85 institutions have been mentioned as supplying satisfactory tuberculin testing figures, only 61 report having discovered cases of tuberculosis. This may be due to various factors. Some schools did not find any cases at all, having tested such small groups that the law of probabilities might rule out their finding a case during a given year. Others did not insist upon a chest X-ray as a follow-up of a positive tuberculin reaction. In this last instance the Committee cannot too strongly urge that X-rays should invariably follow the finding of sensitivity to tuberculo-protein, even if periodic re-rays be not always possible for the whole group thereafter. Otherwise, the tuberculin test would impress us as having represented mostly waste motion. Worst of all is the possibility of having aroused doubt in a student's mind as to his health and his future without having supplied an answer to his legitimate question: "But what does this positive reaction mean in *my* case?"

A strong argument in favor of the adoption of a uniform method of record-keeping emerges when we attempt to state the incidence of adult form pulmonary tuberculosis among the students of those colleges engaged in tuberculin testing. We are correct in reporting that at 85 institutions with an enrollment of 213,698 students there were 214 active and 350 arrested cases discovered, or 564 in all. But we are not privileged to say that that amount of tuberculosis was found in exactly that many students, since the tuberculosis program did not operate to embrace all the students at all the schools, by the testimony of those signing the questionnaires. Neither can we claim that 564 cases of adult tuberculosis infection were revealed by the year's tuberculin-testing of about 56,224 students, because at many institutions the testing figures for 1936-37 refer to newly tested or retested individuals only, former positive reactors not being carried over in the returns we received. Yet, from the ranks of the positives of previous years, through appropriate follow-up procedures, we know there came an undetermined number of the cases reported. Until an improved system of recording and reporting is evolved by the Committee and the co-operating colleges, it seems better, in the interest of statistical accuracy, simply to state the fact that 564 cases were diagnosed in 85 schools practicing tuberculin testing whose student health services protect, in round figures, the health of a little over 200,000 young people, and that cases were found in three-fourths of the colleges conducting the search.

Among those schools that report testing, X-raying or both, of special student groups, are the medical colleges, with their admittedly multiplied hazards as far as tuberculous infection is concerned. We learn with interest and satisfaction of several progressive medical schools that are giving their students the benefit of high-grade case-finding scrutiny. Not only is this a splendid and much needed protection of the medical student, but it should impress each out-going graduate with the importance of such methods and the proper way of carrying them out in his future practice. An organization

known as the Association of Medical Students has appointed a committee on tuberculosis that has recently sent to all medical schools a questionnaire aimed at ascertaining what, if anything, is being done at each institution to safeguard students against tuberculosis. It has for some time been a weak point in the program of our own Committee that our propaganda reaches relatively so few administrators concerned with the health coverage of graduate students. A further attack on tuberculosis is being launched by a committee appointed by the American Clinical and Climatological Association, Dr. W. B. Soper, of Yale, being its chairman. They have been asked to examine the subject of tuberculosis among university students, medical students and nurses, and to present a report to the joint medical congress at Atlantic City next May.

We believe every attempt should be made to coöperate fully with all organizations that, like ourselves, are attacking some segment of the whole student tuberculosis front. We believe that many of our medical schools, nursing schools, and hospitals should drop their present policy of hoping for the best and doing literally nothing about tuberculosis and allied menaces to the health of their students and staffs. We believe they should hasten to set an example of the highest possible level of prevention, early diagnosis and proper handling of those needing care, if only for the sake of meeting their educational obligations. This comes easily under the general head of student health, as it concerns the well-being of those still at student level, if we recognize nurses, internes and residents as in that category.

Previous reports have reminded us that tuberculosis is an even greater problem among Negro students than in those of the white race. There are some 120 colleges for Negroes in the United States, and a great majority of their graduates become teachers. It is hoped that the Negro physicians attacking this problem may have modern facilities with which to achieve their objectives.

LOOKING AHEAD

1. We believe that efforts should be initiated to train student health physicians in the procedures necessary to guarantee them a workable knowledge of tuberculosis and its early detection. This is one place where the large college or university may be able to aid the doctor from the nearby smaller institution.

2. We should like to see compiled a small, illustrated manual descriptive of present-day methods of diagnosing student-age tuberculosis, the same to be made available to all members of the American Student Health Association or other interested persons for a nominal cost.

3. We welcome further studies on the subject of general X-raying of chests *versus* the recommended two-dose tuberculin testing followed by roentgenograms of positive reactors, such studies to include comparative figures as to costs, time saved, and results obtained. Although it has been found that only one positive reactor in seven may show X-ray evidence of his tuberculous infection, the tuberculin test yet remains the only way of discovering all those who are infected.

4. We believe the question of fluoroscopic examina-

tions as substitutes for at least initial chest films is worthy of investigation, but that it does not present itself as a reliable enough method of detecting the earliest evidences of pulmonary tuberculous infiltration unless employed under ideal conditions by an examiner well-trained in its use and granted the very best of fluoroscopic apparatus. We recognize the value of fluoroscopic examination as part of a general physical examination technique, but would for the present prefer to recommend it rather as a diagnostic aid than as a supplanter of chest films. Misused, it can prove misleading and dangerous, as well as representing nothing permanent in the way of record.

5. We would commend to all institutions having difficulty in starting or continuing a tuberculosis case-finding program the solicitation of assistance from their local, county or state tuberculosis organization, through a nearby sanatorium, or through the regional section of the American Student Health Association. The advice and accumulated experience of outside groups may be all that is needed in getting a program under way, while it is true that in some communities actual aid in the form of testing materials, personnel or publicity may be forthcoming.

6. We favor any effort that may succeed in drawing the student health physician and the family doctor closer together in their mutual responsibility of safeguarding the health of students. The findings of the school physician should be made as available as possible to the private practitioner, with the consent, of course, of all concerned. After all, the latter physician is the individual's medical adviser for many more years than is the college doctor. More and more private physicians are evincing friendly interest in the program of health education for which we are responsible. When they realize exactly what we are trying to do in impressing their patients with the importance of such measures as the early diagnosis of pulmonary tuberculosis, still larger numbers of these men will be found prepared and anxious to carry forward that program from the point where our control of it ceases.

7. We should welcome any suggestions toward a linking-up of the whole tuberculosis investigation scheme as it relates to students. This should include making available to the college physician the student's health record of the pre-college years. It should carry on through college and university, with free exchange of information between schools when an individual transfers. We send a transcript of his academic record; why not one with regard to his physical condition? Finally, there should be no gap at graduation, but the health record should then be placed at the disposal of the young person's family physician. Converting such a dream from mere words into action, we can visualize such agencies as the National Tuberculosis Association and other public health organizations working with and through the component members of the American Student Health group, and in close liaison with all practitioners of medicine. Only in such a way can we, who spend usually not more than four years with each student whose

health protection is entrusted to us, hope to do much besides give him a passing pat on the back. Only in such a manner can the whole problem of tuberculosis among young people be viewed with a commanding perspective.

Recommendations

Inasmuch as the Tuberculosis Committee is one of those special groups engaged within the American Student Health Association upon work that not only should continue uninterruptedly from year to year, but shows every indication of increasing in scope and importance as time passes, it is advisable that its efficiency be rendered as complete as possible. To this end we would make the following suggestions:

1. That the Committee be appointed by the president at the annual meeting of the A. S. H. A. as at present, but that appointments date from the following July 1st, for one year, so that the time of service upon the Committee may coincide with the period of the academic year reported upon.

2. That there be appointed by the executives of each of the regional sections a special tuberculosis representative to work with the nearest member of the national Committee in planning and conducting the activities of that section with regard to tuberculosis.

In conclusion, we wish to thank heartily all who have contributed time and thought to the preparation of this seventh annual report of the Tuberculosis Committee.

Respectfully submitted,

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American Student Health Association

North Dakota State Medical Association
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MINNEAPOLIS, MINN., OCTOBER, 1938

AMERICAN MEDICAL ASSOCIATION MEETING

The special session of the House of Delegates of the American Medical Association was called by the Board of Trustees in Chicago, September 16 and 17, 1938, to consider the material presented several weeks ago at the nation-wide, so-called medical conferences held in Washington, D.C. Nearly all of the delegates were present, as well as the Board of Trustees, together with many of the state secretaries and editors of state medical journals. As the subjects to be discussed were many and serious in problem, there were appointed five committees, totalling twenty-five physicians, and in connection therewith a master committee of five doctors, through which latter committee all the findings of the subcommittees would be transmitted to the House for their consideration and final action.

All of these proceedings will be found in the *Journal of the American Medical Association* and deserve very careful perusal by our profession; some of the reports filtering through the daily newspapers have not been entirely accurate.

After considerable discussion of the various topics, the House approved the appointment of an American Medical Association committee of not more than seven physicians, empowered to enter into correspondence with the President of the United States, requesting that he appoint an equally numbered committee, preferably including some physicians, to confer with our committee on the subjects brought out in the Washington confer-

ences and in our House of Delegates meeting. Our committee will consist of the chairmen of the five subcommittees holding forth in our recent sessions, past-President Dr. Cary of Texas and the President of the American Medical Association, Dr. Abel.

A. W. S.

UNITED STAND

The medical profession as a whole must feel gratified at the report of the house of delegates of the American Medical Association which recently met in extra session to consider the program formulated by the National Health Conference at Washington. For some time physicians throughout the country have realized the seriousness of the program that this health conference threatened to force upon them. The atmosphere at the meeting in Washington seemed antagonistic to attitudes expressed by organized medicine.

The house of delegates at their meeting in Chicago on September 15th laid down their policy in five paragraphs: (1) expansion of public health; (2) expansion of hospital facilities; (3) medical care for the medical needy, using local facilities—using federal appropriations only when state funds are unavailable; (4) a general program of medical care, bearing in mind the desirability of helping the citizens to help themselves. Hospital insurance is approved providing it does not include medical care; (5) the committee indorsed the entire program of insurance against loss of wages during sickness, as proposed by the national health conference, which

was analagous to unemployment compensation; the committee opposed government subsidy or control over group hospitalization plans and the "complicated, bureaucratic, political system of compulsory sickness insurance."

Those of the profession who may have felt that the A. M. A. was procrastinating in announcing its attitude must now feel that the delegates in this two-day session have done a Herculean job, that the policy as outlined is unequivocal, and that few, if any, will be likely to feel that they cannot find themselves in full accord with these pronouncements.

A. E. H.

UNIVERSITY OF MINNESOTA HUMAN SERUM LABORATORY

As a result of a gift from Mrs. John Dwan, a human serum laboratory is being established at the University of Minnesota. It will be incorporated in the pediatrics department which provides adequate facilities for research. The laboratory is the seventh one of its kind to be established in the United States. It will serve the physicians of this territory.

C. A. S.

Book Notices

The Principles and Practice of Obstetrics, by JOSEPH B. DELEE, A.M., M.D., Professor of Obstetrics and Gynecology Emeritus, University of Chicago; seventh edition, entirely reset; 1,211 pages with 1,277 illustrations on 985 figures, 271 of them in color; Philadelphia: W. B. Saunders Company; 1938. Price, \$12.00.

The new seventh edition of Dr. DeLee's text on obstetrics, in spite of an earnest desire and great effort to do so, could not be reduced in size—on the contrary, 44 pages have been added. This, however, is not actually all new reading matter since a number of these pages are taken up by new illustrations. The material of the book has been carefully worked over and obsolete matter omitted; new added. The physiology of menstruation, nidation of the ovum and the blood chemistry of the toxemias of pregnancy have been revised. Special attention has been given to the mechanism of labor, the lack of knowledge of which is responsible for a large part of the at present high maternal and fetal mortality and morbidity. Conservatism and intelligent expectancy have been the keynote throughout the volume. Obstetric analgesia and anesthesia have been stressed, the barbiturates and local anesthesia getting much attention. Two popular subjects—endocrines and vitamins—have not been over-emphasized. The new treatment for puerperal sepsis, sulfanilamide, has been described. In Dr. DeLee's own words, the aim of the present volume is defined: "The needs of the student have been considered by putting treatment and less important matter in small type; those of the practitioner by providing a wealth of instructive detail and numerous illustrations. There is hardly an emergency that a man may meet in the home or in the hospital that has not been described and a treatment outlined." The seventh edition commands the highest recommendation.

A Textbook of Gynecology, by ARTHUR HALE CURTIS, M.D., Professor and Chairman of the Department of Obstetrics & Gynecology, Northwestern University Medical

The popularity of convalescent serum as a prophylactic and therapeutic measure in combating contagious disease of childhood is evidenced by the increasingly favorable medical literature regarding its use and effectiveness. The establishment of this laboratory for the collection, processing and distribution of human convalescent serum adds one more weapon to the armamentarium of physicians. Additional research is planned regarding the use of normal human serum in unconcentrated and concentrated form. Clinical reports have appeared relative to the intravenous use of concentrated human serum in nephrosis. The serum has also been used experimentally in shock and severe hemorrhage with favorable results. These and many other vital research problems await workers in this field.

The laboratory will be directed by Dr. E. S. Platou and Dr. Paul F. Dwan who have taken an active interest in this field of work. A limited quantity of convalescent measles and scarlet fever serum will be available for distribution beginning this fall.

School; third edition; 603 pages with 318 illustrations; Philadelphia: W. B. Saunders Company; 1938. Price, \$7.00.

The new third edition of Dr. Curtis' *Textbook of Gynecology* contains eight chapters preliminary to the entirely rewritten subject matter which comprises the bulk of the preceding editions. Because of the demand for anatomy from a gynecological viewpoint, the author has carried on anatomical dissections and has made a concentrated study of pelvic anatomy. Even though this subject was omitted in the former two volumes, the first chapters of the present edition are concerned with anatomy and physiology. There is also a detailed consideration of the endocrines. A new point of view has been developed in this new third edition. Dr. CURTIS says in his preface, "The present text is no longer essentially a record of personal experience, for the literature has been studied with painstaking thoroughness and this volume is intended to cover the entire field of our specialty." The majority of the original drawings were done by TOM JONES. The present volume can be looked upon as one of the best textbooks in the field of gynecology. It should prove highly satisfactory to students as a textbook, to practitioners as a practical source of information and to specialists as a reference.

Surgical Pathology, by WILLIAM BOYD, M.D., LL.D., M.R.C.P., Edinburgh, F.R.C.P., London, Dipl. Psych., F.R.S.C., Professor of Pathology, University of Toronto. Fourth edition, thoroughly revised; 886 pages with 475 illustrations and 15 colored plates. Philadelphia: W. B. Saunders Company; 1938. Price, \$10.00.

Dr. Boyd has added several new subjects to the fourth edition of his *Surgical Pathology*. Lymphogranuloma inguinale, primary thrombosis of the axillary veins, grading of malignant tumors, glomus tumor, parathyroid tumor, the group of ovarian tumors comprising granulosa cell and Brenner tumors and tumors of the islands of Langerhans are some of the new additions. The experimental side of cancer also has been enlarged, especially those subjects dealing with the etiology of tumors, lymphosarcoma, implantations dermoids, carcinoma of the tongue, the relation of hypothalamus to gastric ulcer and of chronic mastitis to carcinoma of the breast. Acute intestinal obstruction, etiology of appendicitis, carbuncle of the kidney and the pathogenesis of renal calculi are developed in detail. The aim of the fourth edition has been to retain the object of the original book; that is to present those aspects of pathology which will prove useful to the surgeon.

News Items

The new \$500,000 Wyman pavilion at Abbott hospital, Minneapolis, was dedicated September 16, 1938. The four-story modern structure, which contains the latest in equipment, increases the hospital capacity to 160 beds. It was named after the late O. C. Wyman of Minneapolis who left a fund for this building.

Dr. F. B. Schleinitz, who has been practicing medicine at Avon, Minnesota, is now assisting Dr. C. A. Boline in his practice at Fergus Falls, Minnesota.

Dr. Fred P. Bestgen, formerly of Sturgis, South Dakota, is now in Timber Lake, South Dakota where he has taken over the directorship of the Dewey County Health Unit.

Dr. C. E. Duncan, formerly located at Roslyn, South Dakota, is now practicing in Pollock, South Dakota. Dr. Duncan is a graduate of the University of Indiana, class of 1908.

Dr. L. F. Hall, formerly of Berea, Ohio, has taken over the duties of city-county health officer for Helena and Lewis and Clark counties, Montana. For the past 13 years, Dr. Hall has been acting secretary of the health board of Cuyhoga county, Ohio. He has been in public health work for 25 years.

Dr. Charles F. Code of the Mayo Clinic, Rochester, was awarded the Theobald Smith medal by the American Association for the Advancement of Science. Dr. Code is a graduate of the University of Manitoba, 1934, and is doing research work at the Mayo Clinic.

Dr. R. E. Walker, formerly of Uniontown, Pennsylvania, has moved to Livingston, Montana, where he is to be associated with Dr. G. A. Townsend and Dr. John Pearson of the Lott hospital staff.

Dr. A. A. Schmitz of Minneapolis, Minnesota has become associated with Dr. E. G. Nethercott in Pine City, Minnesota. Dr. Schmitz who is a graduate of the University of Minnesota medical school recently completed a fellowship in obstetrics in the Minneapolis General Hospital.

Dr. F. W. Vennemann, formerly of Ronan, Montana, has moved to St. Ignatius, where he will practice general medicine and surgery.

Dr. F. M. Feldman who has been head of Rural Health District Unit 2 in Mankato, Minnesota, for the past two years, has been transferred to Rochester to organize a new health unit. Dr. Frederick Gunnar Gunglaugson, former epidemiologist of the Minnesota department of health who has spent the past year studying in the public health school of Johns Hopkins University, Baltimore, will succeed Dr. Feldman. The Rochester Rural Health District unit will be the third established in Minnesota under the state department of health with federal social security funds.

Dr. A. J. Button of Pine River, Minnesota, has opened offices in Walker, Minnesota.

Dr. A. G. Chadbourn, who has been a member of the Southwestern Minnesota Sanatorium commission for several years, was reappointed to that position by the Jackson county board at a recent special session of that body. His new term will run for three years.

Dr. Robert LaBree of Minneapolis is now a surgeon at the state hospital for the insane at Fergus Falls, Minnesota.

Dr. O. F. Mellby, Thief River Falls, Minnesota, was elected president of the Northern Minnesota Medical Society at the two-day convention held in Crookston recently. Dr. C. W. Simison, Hawley, was elected vice-president and Dr. Clarence Jacobson, Chisholm, was re-elected secretary-treasurer.

Dr. Harold Noren, formerly of University hospital, Minneapolis, is now staff physician and pathologist at the state hospital in Hastings, Minnesota.

Dr. R. J. Gully, formerly of the staff of the state hospital at St. Peter, Minnesota, has gone to Cambridge, Massachusetts where he has been appointed superintendent of the new state hospital.

"Refresher courses" in obstetrics, gynecology and pediatrics will be given for North Dakota physicians at two series of district meetings to be held in Bismarck, Dickinson, Minot, Grand Forks and Fargo beginning October 17, 1938.

Dr. George J. Halladay who practiced in Rush City, Minnesota, for the past year, has opened an office in Brainerd, Minnesota. Dr. Halladay was graduated from the University of Minnesota medical school in 1937.

Dr. Henry Hutchinson, who has been senior physician at the Willmar State Hospital in Minnesota for the past four years, is now assistant superintendent of the new Moose Lake State Hospital.

Dr. J. T. Bloedel, formerly of Minneapolis, has joined the staff of the Bratrud clinic at Thief River Falls, Minnesota.

Dr. John E. Boysen has opened an office in Pelican Rapids, Minnesota, his native city.

The annual fall clinic for crippled children in St. Louis, Lake and Cook counties, Minnesota, will be held in Hibbing October 8. Medical examination and vocational consultation for physically handicapped persons under 21 years of age will be provided. The division of services for crippled children of the state board of control is conducting the clinic in coöperation with the Gillette State Hospital for Crippled Children, the Minnesota Public Health association and the division of rehabilitation of the state department of education.

Dr. S. M. Johns, pioneer Velva, North Dakota, physician, has joined the medical staff at the state hospital at Jamestown. Dr. Johns had practiced in Velva since 1901.

Necrology

Dr. Leo Melville Crafts, 75, for 46 years a practicing physician of Minneapolis, Minnesota, died September 22, 1938. A well known neurologist, Dr. Crafts served as dean of the medical school of Hamline university for many years. He was graduated from Harvard medical school in 1890.

Dr. Albert H. Parks, 58, of Minneapolis, Minnesota, died August 30, 1938. Dr. Parks retired in 1933 after 26 years as a practicing physician. He was graduated from Northwestern University school of medicine in 1906.

Dr. Franklin T. Poehler, 66, of Minneapolis, Minnesota, died August 3, 1938. A native of Henderson, Minnesota, Dr. Poehler was graduated from the University of Minnesota medical school in 1896.

RUTH M. MAHON, M.D. 1896-1938

Dr. Ruth M. Mahon of the medical firm of Campbell, Williamson, Benwell and Mahon, Grand Forks, North Dakota, was born at Langdon, North Dakota, May 21, 1896, and died at Livingston, Montana, September 1, 1938.

She received her academic education in the public schools of the state, Oberlin College, Ohio, and the University of North Dakota where she was graduated in 1920. She received her medical degree from Rush Medical College in 1922, and interned for one year in The Women's Lying-in Hospital, Boston, Massachusetts. She came to Grand Forks, North Dakota, in 1923 and became associated with the Clinic of which she continued to be a member.

Dr. Mahon loved her profession and did much by precept and example to maintain its ethical and technical standards. During her fifteen years of practice she made an enviable reputation as a studious, careful and dependable physician. She was a member of local, state and national professional organizations, of Kappa Alpha Theta Sorority, the Order of Eastern Star, the Business and Professional Women's Club and the Presbyterian Church. She also held a lectureship in the School of Medicine of the State University. Dr. Mahon was cut off in the midst of pressing activities.

Well has the poet said, "To live in the hearts of those we leave behind is not to die." Dr. Mahon is assured of this.

We will think of Dr. Mahon as we had known her, a splendid type of professional womanhood; doing her work with an assurance, a dignity and a poise that were characteristic of her; keeping her ideals of life and conduct aloof from the whims of fashion, the calls of society and the turns of fortune; holding her fine qualities of mind and heart as it were in trust as community assets; generously giving the best of herself for the welfare of others; and attaining her highest aspirations.

J. G.

Future Meetings

Minnesota Medical Alumni Association

The Minnesota Medical Alumni Association will hold its annual business meeting at a luncheon at the University Hospital on Friday, October 14. This is the day preceding the Homecoming game with Michigan. The president of the association, Dr. Robert L. Wilder of Minneapolis, has appointed Dr. Harold G. Benjamin as chairman of the program committee for the clinical presentations at the hospital on Friday morning.

PROGRAM

From 8:30 to 12:00 on Friday morning, October 14th, there will be a program of clinics to be held in Todd Amphitheatre of the University Hospital, University of Minnesota, Dr. Harold G. Benjamin, Chairman.

CLINICS

Dr. Ralph T. Knight; Associate Professor and director of the Division of Anesthesia.

Dr. Horace Newhart; Professor of Otolaryngology.

Dr. Irvine McQuarrie; Professor of Pediatrics.

Dr. O. H. Wangenstein; Professor of Surgery.

Dr. J. L. McKelvey; Professor of Obstetrics.

Dr. Cecil J. Watson; Associate Professor and director of the Division of Internal Medicine.

Dr. J. C. McKinley; Professor of Neurology and head of the Department of Medicine.

12:15 to 1:15—Luncheon in the Nurses' Hall at the weekly hospital staff meeting by courtesy of Mr. Ray Amberg, Superintendent of the Hospital.

1:15—Annual business meeting, Dr. Robert L. Wilder, President.

ADDITIONAL ACTIVITIES OF THE HOMECOMING WEEKEND

Appreciation dinner for Dr. J. C. Litzenberg, the retiring chief of the Department of Obstetrics, at the Minnehaha Club at 6:00 p. m., Friday, October 14th.

Following the homecoming game, Saturday, between Minnesota and Michigan there will be a tea in the Nurses' Hall with dancing and refreshments. This event is sponsored by the nurses who are inviting the attendance of student and graduate nurses, doctors, dentists, dental hygienists and medical technicians.

American Student Health Association

The annual meeting of the American Student Health Association will be held December 29-30, 1938, at the Hotel New Yorker, New York City.

Montana Public Health Association

The Montana public health association will hold its annual meeting at Great Falls, October 10 and 11.

Minnesota State Board of Medical Examiners

Julian F. DuBois, M.D., Secretary
St. Paul, Minnesota

DOCKET OF CASES

Minneapolis Drug Addict Sentenced to 10 Year Term for Obtaining Morphine by Misrepresentation

Re: STATE OF MINNESOTA vs. KATHRINE BURKHARDT

On June 8, 1938, Kathrine Burkhardt, 36 years of age, entered a plea of guilty to an information charging her with obtaining morphine by fraud, deceit, misrepresentation and subterfuge. She was sentenced by the Honorable Edward A. Montgomery, Judge of the District Court at Minneapolis, for a term of not to exceed 10 years in the Women's Reformatory at Shakopee.

The defendant, a drug addict, is the first person to be prosecuted under the Minnesota Uniform Narcotic Drug Act for obtaining morphine by fraud or misrepresentation. This law was passed in 1937 by the Minnesota Legislature and provides, among other things, as follows:

"Sec. 18. *Restrictions on obtaining drugs.*

(1) No person shall obtain or attempt to obtain a narcotic drug, or procure or attempt to procure the administration of a narcotic drug, (a) by fraud, deceit, misrepresentation, or subterfuge; or (b) by the forgery or alteration of a prescription or of any written order; or (c) by the concealment of a material fact; or (d) by the use of a false name or the giving of a false address.

(2) Information communicated to a physician in an effort unlawfully to procure a narcotic drug, or unlawfully to procure the administration of any such drug, shall not be deemed a privileged communication."

The maximum penalty for a violation of the Act is 5 years imprisonment in a state penal institution. The defendant in this case received a 10 year sentence because she had two prior convictions for felonies in the United States District Court.

The Minnesota State Board of Medical Examiners was asked to cooperate with the Federal Bureau of Narcotics at Minneapolis in the prosecution of this case. The facts indicated that the defendant was an addict and between March 26, 1938, and May 30, 1938, had obtained 19 prescriptions for a total of 233 1/4-grain morphine sulphate tablets from six Minneapolis physicians. She obtained these prescriptions by misrepresenting her physical condition and falsifying her name and her address. On being questioned by Judge Montgomery, the defendant stated that she was raised at Wabasha, Minnesota, and that her true maiden name was Kathrine Mahoney; that her married name was Burkhardt and that she was divorced in 1926. She stated that she had been addicted to the use of morphine for the past 16 years. On being questioned by Judge Montgomery with respect to her physical condition she stated that she suffered from chronic asthma; that she had a tumor on her spine and that she suffered from adhesions following an operation. The defendant gave her true address as 1155 15th Avenue S. E., Minneapolis, where she resided with a sister.

The defendant used many aliases in obtaining these prescriptions, among them being the names of Barnes, Berg, Varnes, Fairchilds, Johnson and Peschke. In 1933 the defendant was sentenced by Judge Nordbye in the Federal Court in Minneapolis, to a three year term in the Federal Industrial Institution for Women at Alderson, West Virginia. This sentence was imposed for a violation of the Harrison Narcotic Act. In 1936 the defendant was sentenced by Judge Joyce in the Federal Court at St. Paul for a 10 months term in the Minneapolis Work House for a similar offense. The defendant also was

in the Minneapolis Work House on four different occasions for vagrancy and once for the unlawful possession of morphine, in addition to the foregoing sentences in Federal Court.

The Minnesota State Board of Medical Examiners wishes to express its appreciation of the fine cooperation displayed in this case by the Federal Bureau of Narcotics in Minneapolis under the supervision of Mr. Harry D. Smith, and also the fine cooperation shown by Mr. Ed J. Goff, County Attorney, and his assistants, Mr. Peter S. Neilson and Mr. Allen T. Rorem. The Medical Board believes that the enforcement of this particular provision of the Minnesota Uniform Narcotic Drug Law will greatly reduce the number of addicts who go about this state and attempt to procure morphine from one physician after another for the sole purpose of satisfying their craving for narcotics. The Medical Board wishes again to particularly caution the medical profession against furnishing or prescribing narcotics for these addicts. Most of them will not submit to a physical examination nor do they want to be hospitalized. The Medical Board feels that the imposition of a few more sentences like the one in this case, will go a long way toward solving this problem. There can be no question but what these persons need medical treatment and hospitalization, but it goes without saying that their addiction cannot be removed in a period of a few months.

Minneapolis Naturopath Pays \$200.00 Fine

Re: STATE OF MINNESOTA vs. FRANK DAHLMAN

"Dr." Frank Dahlman, 63 years of age, entered a plea of guilty on July 7, 1938, before the Honorable Levi M. Hall, Judge of the District Court of Hennepin County, to an information charging him with practicing healing without a basic science certificate. Judge Hall ordered the defendant to pay a fine of \$200.00 or serve six months in the Minneapolis Work House. Dahlman elected to pay the fine and Judge Hall ordered it deducted from his cash bail.

Dahlman was arrested on June 18, 1938, following an investigation that disclosed he was maintaining an office in his home at 2507 Emerson Ave. N., Minneapolis. Although Dahlman holds no license to practice any form of healing in the State of Minnesota, he represented himself to the public as a naturopath. On the walls in his office he had a diploma from the so-called American University, Chicago, Illinois, dated January 21, 1920, conferring upon Dahlman the degree of Doctor of Chiropractic. Dahlman stated, at the time of his arrest, that he did not attend this school and that he received the diploma by mail on the payment of \$50.00. He also had a diploma from the Kellberg Institute in Chicago, in massage and hydrotherapeutics. This diploma is dated April 27, 1920. He had a certificate from the National College of Obstetrics and Midwifery in Chicago, dated June 2, 1924. In addition to a membership certificate in the Minnesota Naturopathic Association, he also had a postgraduate certificate from the Minneapolis College of Naturopathy, dated December 27, 1928. Prior to entering the field of healing, Dahlman had worked at one of the flour mills in Minneapolis; he also had been employed as a tailor. At the time of his arrest Dahlman had in his office, medicine bottles that would contain, when full, approximately 40,000 tablets of medicine; he had on his person the sum of \$1,042.00 in cash. He stated that he had no confidence in banks which caused him to keep such a large sum of money in his home. The investigation disclosed that many of Dahlman's patients came from Shakopee, Chaska, Carver and Norwood, Minnesota, in addition to a few from Frederic, Wisconsin.

On various occasions Dahlman has represented himself to the public as a chiropractor, chiropodist, electropath, masseur and naturopath. In 1927 he obtained a massage license from the old Minnesota Massage Board but did not renew this license in 1929 when the masseurs were placed under the Minnesota State Board of Medical Examiners. Dahlman, at one time, was chairman of the Membership Committee of the Minnesota Naturopathic Association.

Very fine cooperation was received in this case from Ed J. Goff, County Attorney, and his assistant, Mr. Peter S. Neilson. Splendid assistance was also rendered by the Minneapolis Police Department.

Non-Medical "Interne" Pleads Guilty to Practicing Medicine Without a License

Re: STATE OF MINNESOTA vs. HALSTED

On June 1, 1938, Hugh David Halsted, 26 years of age, entered a plea of guilty in the District Court at Minneapolis, to an information charging him with practicing medicine without a license. Following a statement of the facts to the Court, Judge Edward A. Montgomery sentenced Halsted to one year in the Minneapolis Work House and placed him on probation for one year. On April 19, 1938, Halsted was tried before a military court at Fort Snelling on a charge of misrepresenting his rank as an officer and misrepresenting his qualifications as a physician. He pleaded guilty to both charges and was given a dismissal from the military service of the United States.

The investigation conducted by the Minnesota State Board of Medical Examiners, which resulted in the filing of a complaint against Halsted by Mr. Brist on behalf of the Board, disclosed that Halsted was born September 29, 1911, at Milwaukee, Wisconsin. Before moving to Minneapolis in the summer of 1929, Halsted resided in Chicago, and Chattanooga, Tennessee, graduating from high school in the latter place. From 1930 to 1933 inclusive, Halsted was a truck driver for the Harriet Laundry in Minneapolis. For a short period in 1934, Halsted worked as a shoe salesman for Dayton's Department Store. Along in the late summer and early fall of 1934, he spent some spare time at the Minneapolis General Hospital. Halsted stated that he always had a desire to be a physician and this prompted him to "hang around" the Minneapolis General Hospital. From October 10, 1934, to January 1, 1935, Halsted acted as an interne at Minneapolis General Hospital, according to a letter written by Dr. C. E. Remy, then superintendent. From January 1, 1935, to June 25, 1935, Halsted was an interne at \$50.00 per month at the Deaconess Hospital in Minneapolis. When inquiry was made at Deaconess as to why no investigation had been made of Halsted's credentials as a physician, the explanation was given that Halsted had previously been at Minneapolis General, and they assumed his credentials were in order. On July 5, 1935, after fraudulently representing himself as a physician and a graduate of the medical school at Northwestern University, and that he was licensed to practice medicine in Illinois, Halsted signed a contract to act as contract surgeon for the CCC Camps in Minnesota. No investigation was made at that time by those in charge to ascertain Halsted's qualifications. He was assigned to Camp No. 703 at Schroeder, Minnesota. In October of that year he was transferred to Allen, Minnesota. During the winter of 1935 and 1936 he was at Camp No. 724 at Ray, Minnesota. In the spring of 1936 he was transferred to Two Harbors, and subsequently to Rochester and Fort Snelling. In September, 1935, Halsted received a commission as a first lieutenant in the Medical Reserve Corps of the United States Army. This commission was obtained upon his fraudulent representations with respect to his medical training.

In September, 1937, Halsted "promoted" himself to a Captancy in the Medical Reserve Corps. Following his marriage in 1936, Halsted was paid \$262.00 per month by the Government. In February, 1938, inquiry was made concerning Halsted's qualifications as a physician which led to his court martial on April 19th. The only medical education that Halsted ever received was in the Extension Division of the University of Minnesota in the year 1930-1931, at which time he was enrolled in a class in General Inorganic Chemistry. In the school year 1931-1932, he was enrolled again in a similar extension course and the records indicate that he failed.

This case again emphasizes the necessity of more care being exercised by hospitals in Minnesota in the selection of their internes. Halsted violated the Medical Practice Act of Minnesota while he was at Minneapolis General, at the Deaconess Hospital and in the CCC Camps. At no time, during his career, did he have any right to represent himself as a physician and surgeon, nor to assume to act in that capacity. Judge Montgomery, in passing sentence, remarked that he did not understand how Halsted got by as long as he did. While he was at Fort Snelling, Halsted resided at 2284 Highland Parkway, St. Paul; at the time of his arrest he resided at 4039 Pillsbury Avenue, Minneapolis.

Austin Doctor Dies Following Arrest

Re: STATE OF MINNESOTA vs. FANNIE FIESTER

On Wednesday, May 4, 1938, the Minnesota State Board of Medical Examiners received a telephone call from Mr. A. B. Anderson, County Attorney of Steele County, advising them that Mr. and Mrs. Anton Ruzek, R. F. D. No. 2, Blooming Prairie, were in his office to make a complaint that a lady doctor at Austin had performed a criminal abortion upon their 18-year-old daughter. The cooperation of the Medical Board was requested in making the investigation and Mr. Brist was assigned to this case.

Following the investigation, which was immediately made, and which included a long signed statement by the daughter, a complaint was filed on May 5, 1938, by the mother, and a warrant issued for the arrest of Dr. Fannie Fiester of Austin. Dr. Fiester was questioned by Mr. Edward T. Helgeson, Sheriff of Steele County, and Mr. Brist, and also by Mr. A. C. Richardson, County Attorney of Mower County. Dr. Fiester admitted having performed the criminal abortion and also admitted performing a number of other unlawful abortions. Dr. Fiester was very frank in her statements, and upon being arraigned in the Municipal Court at Austin, she was released on condition that she furnish a \$500.00 bond. The matter was continued until Friday morning, May 6th, at which time it was learned that Dr. Fiester was found in a serious condition and died that evening about 10 P. M. Mrs. Ruzek also filed a complaint against Mrs. Clara Cole of Blooming Prairie in connection with this case, and also a complaint against Lyle Cole, 24-year-old son of Mrs. Cole. The complaint against Lyle Cole was filed in Steele County.

This statement is made by the Medical Board in fairness to everyone concerned, and particularly in view of the fact that the case ended in the manner that it did. The Board feels that Mr. Anderson and Mr. Stone, the Assistant County Attorney at Owatonna, Sheriff Helgeson, Mr. Richardson and Deputy Sheriff Enochson of Austin, were sincerely attempting to perform their duty in respect to this case, and that while it had a tragic outcome, the entire matter should serve a worthwhile purpose.

Minnesota Physician's License Suspended for Two Years

In the Matter of the Revocation of the License of

HAROLD REES, M.D.

On May 13, 1938, the Minnesota State Board of Medical Examiners suspended for a period of two years the license to practice medicine held by Dr. Harold Rees of Minneapolis. Dr. Rees' license was suspended because of habitual indulgence in the use of narcotics. His case was called to the attention of the Board by a shortage in his supply of morphine and cocaine discovered by agents of the Bureau of Narcotics.

Dr. Rees is at the State Hospital at Willmar at the present time following his commitment from Hennepin County on April 13, 1938. Dr. Rees has been at Willmar on several previous occasions and the leniency shown him on those occasions accomplished nothing. If Dr. Rees leaves the hospital this time before he is discharged by competent authority his license will be revoked permanently.

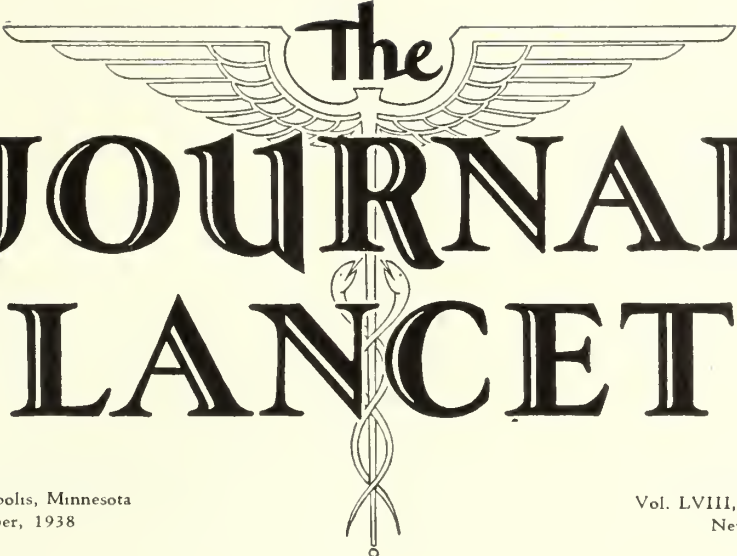
Dr. Rees was born in Norway in 1869 and is a graduate of Rush Medical College in 1896. He was licensed in Minnesota by examination in 1900. Dr. Rees has practiced in the following towns in the past ten years: St. Paul, Cambridge, New London, Ogilvie, Rose Creek, Rushmore and Minneapolis.

St. Paul Physician's License Suspended for Two Years

In the Matter of the Revocation of the License of

NELS G. MORTENSEN, M.D.

The Minnesota State Board of Medical Examiners, at its regular meeting held on July 16, 1938, suspended, for two years, the license to practice medicine held by Nels G. Mortensen, M.D., St. Paul. Dr. Mortensen was found guilty by the Board of "immoral, dishonorable and unprofessional conduct," and specifically with "procuring, aiding and abetting a criminal abortion."



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Diabetes Mellitus and Protamine Zinc Insulin*

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Missoula, Montana

DIABETES has been defined as a disturbance in the production and utilization of insulin characterized by an altered carbohydrate and fat metabolism which results in increased values for blood sugar, blood cholesterol, acetone bodies and glycosuria together with acetone and diacetic acid in the urine.

The incidence of diabetes has about doubled in the last fifteen years. There are now about five hundred thousand cases of diabetes in the United States. Under thirty years of age, there are more cases in males than in females, but after the thirtieth year the reverse is true. Under the age of twenty years the incidence is only about 0.4 per thousand population; between the ages of twenty and forty the incidence is about 1.5 per thousand population; and over the age of forty the rate jumps to 10.2 per thousand. Diabetes is most common among the white race, and here it is found most frequently among the Jews and the Irish. It is about twice as common among the Jews as among the Gentiles. It is less prevalent among the laboring classes and is more prevalent in the upper part of our social strata. It is more frequently found in our urban population than in the rural districts.

The exact etiology is unknown. Joslin states that in his cases 20 per cent had a family history of other cases in the family. Severinghaus refers to the work of Pincus and White who have reached the following conclusions:

1. A diabetic mother and a diabetic father are quite apt to have children all of whom are predestined to have diabetes.

2. One diabetic parent plus a carrier of potentiality to acquire diabetes and one-half of the children are predestined to have diabetes.

3. If both parents are carriers of potentialities for diabetes, one-fourth of the offspring are predestined to have diabetes.

4. A diabetic parent plus a parent who does not have diabetic potentialities will not have any diabetic children.

This work has not been proved and several generations must pass to get data on which to prove or disprove this theory.

Joslin stresses the fact that in his cases around middle age about 80 per cent of diabetics are 5 per cent or more overweight. However, we must consider that in middle age people are prone to become overweight just as they are to become diabetic, and it is not at all improbable that both factors are pituitary in origin. Juvenile diabetics have a tendency to be tall which also is probably a pituitary characteristic. Wilder is of the opinion that obesity is a factor only in those cases that are predestined to have diabetes. Infection may be the precipitating factor which causes the clinical signs and symptoms to appear, but it should be remembered that the basic chemical changes may have existed for a long period of time.

Hinsworth and others have shown that the carbohydrate intake has no relation to the development of diabetes. He has demonstrated that groups of individuals utilizing greater carbohydrate and lower fat diets had less diabetes than other groups eating a higher fat and a lower carbohydrate diets. Mills has shown no particular correlation between the increasing consumption of

* Read before the Montana branch of the American College of Physicians, Helena, Montana, May 14, 1938.

† Northern Pacific Beneficial Association Hospital.

carbohydrate and increased incidence of diabetes in the various nations of the world.

Soskin considers diabetes a disease in which the threshold for glucose storage in the liver is abnormally high because of the endocrine imbalance, and as a result the liver continues to pour sugar into the blood even in the presence of a marked hyperglycemia. Since the threshold and not the sensitivity of the liver is affected, he postulates that insulin lowers the threshold, so regulation at normal blood sugar levels is possible.

It is a common clinical observation that patients with thyrotoxicosis may have signs and symptoms of diabetes that disappear after the thyroid has been treated adequately. However, thyroidectomy in a true diabetic does not cure the diabetes. Bodansky feels that some hormone from the thyroid promotes glycogenolysis (conversion of glycogen to glucose). There is some definite relationship between the thyroid and carbohydrate metabolism which at the present time is vaguely understood.

Houssay and his collaborators have established a definite relationship between the pituitary gland and pancreatic function regarding insulin. His experiments can be summarized as follows:

1. Injection of anterior pituitary extract in a dog causes a disturbance in carbohydrate metabolism, *e. g.*, increased blood sugar values, glycosuria and a diabetic type of glucose tolerance curve.

2. Removal of the hypophysis of a dog will cause increased sensitivity to insulin. After this operation, hypoglycemia, even without insulin injection, may result in convulsions or even death.

3. If the hypophysis is removed from an already depancreatized (diabetic) dog, and the glycosuria, hyperglycemia and acidosis are ameliorated, the dog may live months, though ultimately death occurs.

4. This hypophysectomized and depancreatized dog is known as the "Houssay Dog." Interesting experiments have been carried out on this dog.

- a. Injections of small amounts of pituitary (anterior) extract result in elevation of the blood sugar, glycosuria and acidosis.
- b. Anterior pituitary extract and insulin administered together carefully neutralize each other in effect.
- c. Houssay dogs can store glycogen in the liver and muscles in normal amounts, and glucose tolerance tests may be normal. This is very important when one remembers that the pancreas has been removed.

In regard to clinical evidence in the human in support of Houssay's theory of diabetes, Collip has, he believes, definite evidence of a diabetogenic hormone acting against insulin, which is produced in the hypophysis. It should be noted in this connection also that the acromegalic is predisposed to diabetes. Wilder states that 10 per cent of the acromegalics at the Mayo Clinic are affected with diabetes.

The adrenal gland has been recognized for many years as playing a definite rôle in carbohydrate metabolism. In Addison's disease the depression of blood

sugar and increasing sensitivity to insulin has been noted. In adrenal insufficiency Britton and Silvette noted a decrease in blood sugar and a diminished glycogen storage in the liver.

The islands of Langerhans are at present the only major source of insulin. Hyalinization and disappearance of islet tissue are, according to Bell, the most common and characteristic changes in the diabetic pancreas. When one considers that in only 50 per cent of cases are there changes enough to make a definite diagnosis of diabetes from microscopical study of pancreatic tissue, and in only one-fourth of the cases are the changes marked enough to explain the resultant clinical picture, one realizes that pancreatic deficiency is not the complete explanation. The question as to whether or not there are two separate causes of diabetes (endocrine and pancreatic) has been raised, but as yet is unanswered.

Diabetes is usually classified as mild, moderate or severe. In mild diabetes the fasting blood sugar is slightly elevated, rises to a peak and is falling in two and one-half hours. In moderate diabetes the fasting blood sugar is higher, the peak is reached in one-half to one hour and the elevation is maintained. In severe diabetes the fasting blood sugar is markedly elevated and it continues to rise throughout the test, the two and one-half hour test of the blood sugar being the highest. In practice it is wise to treat all diabetics as if they were severe cases.

TREATMENT

Joslin is quite emphatic in stating that diabetes is a disease that requires prolonged and personal supervision by the same doctor. It is a disease for the family doctor to treat for life. The patient and his home associates must be taught how to calculate his diet in grams of carbohydrate, protein and fat. The patient must learn the classification of foods into groups according to their content of carbohydrate. He must have a suitable food scale, preferably one which weighs food in two gram amounts up to 500 grams, and one with a rotating dial. He must be taught how to measure insulin and protamine zinc insulin in his hypodermic syringe according to the various strengths that are on the market and that he may have to use. Then he must learn how to take his own injections so that he will be independent and will not have to depend on others. He should have a convenient case for carrying a bottle of insulin and his hypodermic outfit which should be as small as possible but still complete. Testing the urine for sugar should be done once or twice daily, and for this the Lilly (Sheftel) test case is very compact and accurate. In addition he should have some diabetic primer for reference. These instructions should all be given by the doctor who should assume all responsibility in educating the patient along diabetic lines. A trained dietitian is a great help, but she should be used only as an assistant. The patient should also be taught how to balance the dose of insulin against his diet, and how and when to make changes in the insulin dosage.

I have prepared a sheet which I give to my diabetic patients; on one side there are a few simple rules for

DIET CALCULATION

1. Use even amounts of foods, as:
 5 or 10 of butter or mayonnaise on vegetables.
 15, 30, 60, 75 of butter for daily portions.
 50, 75 or 100 of vegetable or vegetable puree.
 50-100 of fruit.
 20-200 of fruit juice.
 60-120 of meat.
 25 or 50 of 40% cream.
 50, 100, 150 or 200 of milk.
 50, 100 or 150 of 20% cream.
 15, 30 or 60 of bread.
 15, 30 or 60 of cheese.
2. Carbohydrates must be divided evenly between the three meals for diabetic diets. This is not necessary for non-diabetic diets. It is rarely necessary to divide the Protein and Fat evenly.
3. Totals for Carbohydrates, Protein, Fat at the end of the diet must be correct within three grams.
4. Carbohydrate foods are: bread, cereal, fruit, fruit juice, vegetables, potatoes, milk.
5. Protein foods are: meat, fish, chicken, cheese, eggs, milk. Fat foods are: cream, butter, mayonnaise, fat meats and cheese.
6. Do not use: part of an egg—sugar or jam on a diabetic diet—diabetic fruits or desserts on a non-diabetic diet.
7. Remember that: 40% cream is the most expensive way to add fat. All portions must approximate normal ones in size.

AVERAGE FOOD VALUES

	Carbo- hydrates	Protein	Fat
Vegetables			
100 3% vegetable	3	2	---
100 6% vegetable	6	2	---
100 9% vegetable	9	3	---
100 12% vegetable	12	4	---
100 15% vegetable	15	3	---
100 18% vegetable	18	3	---
100 21% vegetable	21	8	---
Fruits			
100 3% fruit	3	1	---
100 6% fruit	6	1	---
100 9% fruit	9	1	---
100 12% fruit	12	1	---
100 15% fruit	15	1	---
100 18% fruit	18	1	---
100 21% fruit	21	1	---
Cereals			
100 dry cereal	76	10	2
100 cooked macaroni	16	3	1
100 cooked rice	24	3	---
Bread			
100 bread	52	9	1
30 bread	16	3	---
1 soda or graham cracker	5	1	1
1 saltine	2	---	---
20 matzos (1 round tea)	14	3	---
50 matzos (1 square)	31	7	---
Meats			
100 meat, average	---	22	15
100 meat, lean	---	28	8
100 fish	---	20	5
100 chicken, white	---	21	2
Dairy Products			
100 American cheese	---	29	36
30 American cheese	---	9	11
100 cream cheese	1	19	27
30 cream cheese	---	6	8
100 cottage cheese	4	21	1
30 cottage cheese	1	6	---
100 butter or mayonnaise	---	1	85
30 butter or mayonnaise	---	---	25
100 20% cream	4	2	18
100 40% cream	1	2	41
2 eggs	---	12	12
1 egg	---	6	6
100 buttermilk	5	3	---
25 40% cream	---	---	10
100 skim milk	5	3	---
100 whole milk	5	3	4
Miscellaneous			
100 sugar	100	---	---
100 jam	84	1	---

CLASSIFICATION OF FRUITS AND VEGETABLES

6% Fruit	Lettuce
Muskmelon	Radishes
Strawberries	Romaine
Watermelon	Sauerkraut
9% Fruit	Spinach
Blackberries	Squash, summer
Cranberries	String Beans, canned
Grapefruit	Tomatoes
Grapefruit Juice	Tomato Juice
Tangerines	Water Cress
12% Fruit	6% Vegetables
Apricots	Beans, string, fresh
Cherries, black	Egg Plant
Cherries, sour	Kohlrabi
Oranges	Peppers, green
Orange Juice	Squash, winter
Peaches	Turnips
Pineapple	9% Vegetables
Plums	Beets
Raspberries	Brussel Sprouts
15% Fruit	Carrots
Apples	Onions
Blueberries	Peas, canned
Grapes	15% Vegetables
Nectarines	Parsnips
Pears	Peas
18% Fruit	18% Vegetables
Cherries, sweet	Corn, canned
21% Fruit	Potatoes
Bananas	21% Vegetables
Prunes	Lima Beans

3% Vegetables	To make cocoa: Instead of 200
Asparagus	milk give
Broccoli	175 milk
Cabbage	3 cocoa
Cauliflower	water
Celery	saccharin
Cucumber	Boil water and cocoa, add milk
Endive	and heat. Add saccharin to taste.

DIET

NAME

Carbohydrates 150, Protein 75, Fat 90, Calories 1710

WEIGHT Grams | Oz.		FOOD		
		Breakfast		
100		12% fruit	12	1
20		cream of wheat	15	2
		2 eggs	0	12
30		toast	16	3
6		butter	0	0
50		20% cream	2	1
100		milk	5	3
		coffee		
			50	22
		Lunch		
90		average meat	0	20
100		18% vegetable	18	3
100		3% vegetable	3	2
30		bread	16	3
18		butter	0	0
100		12% fruit	12	1
		tea		
			49	29
		Dinner		
30		cold meat—average	0	7
100		9% vegetable	9	3
100		3% vegetable	3	2
30		bread	16	3
200		milk	10	7
20		butter	0	0
100		12% fruit	12	1
			50	23
		Bedtime		

DIABETIC DAILY RECORD

[illegible]

diet calculation, below which I have a classification of fruits and vegetables together with average food values of average portions. Below this is a place to figure out a skeletal diet for one day. The patient soon learns how to use it effectively and it makes diabetic arithmetic seem much more simple. On the opposite side of the sheet is a daily record of the diet, weight, insulin and protamine zinc insulin dosage and the urine tests. By watching this record he can regulate his insulin dose and change the diet when the weight is not acting right.

Dietary care is fully as necessary with protamine zinc insulin as with regular insulin. A diet composed of one gram of protein to the kilogram of body weight in an adult, giving more protein to young adults and to children, and an amount of fat equal to 80 to 120 grams daily and carbohydrate sufficient to provide the requisite number of calories daily will be found to be very satisfactory. An adequate diet should maintain the normal weight and strength of the patient at an optimal level. The food intake has to be distributed throughout the day as the absorption of the protamine zinc insulin is gradual throughout the 24 hours of the day. It is sometimes advisable to divide the food into four feedings instead of three, giving three meals and an extra bedtime feeding to guard against a hypoglycemic reaction during the early morning hours. A bedtime feeding of 200 grams of milk, 30 grams of bread and 10 grams of butter is good insurance against an early morning insulin shock.

Insulin is an extract prepared from the islands of Langerhans in the pancreas. It is freely soluble in the body fluids and when injected is rapidly absorbed with the result that it exerts its maximum effect within three to four hours. Its injection in cases of diabetes to control carbohydrate metabolism has given excellent results and its use in diabetes has given these patients a material increase in their span of life. In the rather severe cases a number of injections have sometimes been necessary each day to control the diabetes and even then some cases have alternating attacks of hypoglycemia and glycosuria. Some of these cases, particularly in children, have had to have injections of insulin during the night, so that it has been necessary in some cases to set the alarm clock and get up to give a dose of insulin.

It has been recognized for a long time that some form of slow acting insulin would be much more preferable to regular insulin, as larger doses of insulin could be given at one dose, and fewer injections would be necessary. In this manner the blood sugar level could also be kept more uniformly maintained. This would be particularly valuable in those cases that had to get up at night to take insulin to avoid the nocturnal hyperglycemia.

Various mixtures of insulin with other substances were tried experimentally, such as gum arabic, lecithin, arachis oil, castor oil, epinephrin, and pituitary extract. Hagedorn found that when he mixed insulin with protamines in a properly buffered solution, a protamine insulin precipitate was formed. The solubility of the precipitate and its absorbability in the body fluids are very low. Consequently, upon subcutaneous injection of a suspension

of the precipitate, a depot of supply from which insulin is slowly absorbed by the body fluids is made available. Later the Toronto group experimented by adding small amounts of zinc, which they found to be very valuable as it still further slowed down the absorption of insulin in the body fluids after injection. Now with the protamine zinc insulin it is possible to control most diabetic patients more evenly with only one injection of this new preparation than it was formerly with a number of injections of regular insulin. Much experimental work has been done which shows that this small amount of zinc which is added to the protamine insulin has no deleterious effect on the body. As the mixture is a suspension, it is very important that a constant proportion of the precipitate be present in each dose injected. To insure this result, the vial should be rotated and inverted from end to end several times before the withdrawal of each dose for injection.

The slower acting preparation of protamine zinc insulin seems to work most effectively when given about an hour before breakfast. A majority of adult cases can be carried along very nicely on a single dose of this new preparation daily, but in juvenile cases and a few adults an extra dose of regular insulin is sometimes necessary in addition to the protamine insulin in order to take care of the breakfast or in some cases even small doses before some of the other meals may be necessary. The protamine insulin does not have much effect for a few hours, and unless there is enough to carry over effect from the dose given the previous day, a small dose of regular insulin may be necessary to take care of the first succeeding meal. The protamine insulin is usually being absorbed fast enough by the time of the next two meals so that no extra insulin is required. In most cases there will be no hyperglycemia during the night.

To be sure that you have carbohydrate metabolism under control most of the time, it is advisable to make urine sugar tests before each meal and at bedtime. In this manner it is possible to tell just when and how much sugar is being lost, so that you can individualize the dose of insulin and the time of injection. Blood sugar determinations can be made from time to time, but in most cases urine sugar tests are all that are needed. Joslin states that the most important sugar tests of the urine are before breakfast to see if the previous day's protamine insulin dose was correct, and before dinner to see if the dose of regular insulin was correct. Wilder is of the opinion that if we can keep the morning specimen clear most of the time, we will have our patient adequately controlled. He does like to have a green test with Benedict's solution occasionally, so that he can feel that the patient is not having hypoglycemia. If the specimen is clear every morning, a blood sugar test should be made or the dosage of protamine zinc insulin should be reduced until an occasional green test shows, as a continued hypoglycemia of low grade may do more harm than an occasional trace of sugar. Another point of importance is the fact that the morning specimen of urine contains all the excretion from the kidneys since the evening before when there may have been a slight amount of sugar and the test may show

some sugar, while in reality the patient may be in insulin shock in the early morning hours. If the patient will discard the first voiding and then take another specimen about fifteen minutes later, the latter specimen will be more truly indicative of his condition. A blood sugar test may be taken at this time to tell the exact state of the patient. This is one of the important things to watch when we are treating someone with protamine zinc insulin, especially after the patient leaves the hospital with the possibility that he may go into serious shock during the early morning hours far away from the hospital, doctor or source of intravenous glucose for emergency. This should be emphasized to the patient, and if he is clear every morning, he should be advised to reduce the dosage of protamine insulin. If the patient shows a trace of sugar in the noon specimen and is clear the rest of the day and before breakfast, he can be considered as adequately controlled.

Patients who require a combination of regular insulin and protamine zinc insulin should be instructed to use separate syringes for each kind and to inject them at different sites. The area where the protamine zinc insulin is injected should be gently massaged as otherwise the absorption may be uneven and lead to periodic hypoglycemic reactions. If there is any mixing of the two insulins, either in the syringe or in the tissues, it will tend to slow down the action of the regular insulin and defeat our purpose in giving the regular insulin.

The transition in changing a patient from regular insulin to protamine zinc insulin takes a period of a week or two. You can usually start by giving the total number of units of protamine zinc insulin in one dose before breakfast corresponding to the total daily dose of regular insulin given previously. It may be necessary during the first few days to supplement this with a few small doses of regular insulin. Do not change the dose of protamine zinc insulin oftener than once in three days, as there is some cumulative effect; and if you increase the dose too fast, you may send the patient into a severe hypoglycemic shock. After the change is made, most patients show a marked improvement in their general condition and also a gain in their carbohydrate metabolism.

Local reactions develop with protamine zinc insulin at times, but these have been growing less frequent. Usually if the dose is continued the reactions become less and less and finally disappear. In these cases, U 80 protamine zinc insulin has the advantage in that there is less volume to be injected; and therefore it is less likely to produce local reactions with induration and soreness.

In the preoperative and postoperative treatment of diabetic patients who have surgical complications, protamine zinc insulin has proved to be of value. At the Mayo Clinic, diabetic patients receive from one-half to two-thirds of the regular dose of protamine zinc insulin before going into surgery. If the patient has been receiving regular insulin also, it is omitted. Any glycosuria that occurs after the operation is treated with regular insulin as needed. This dose is repeated daily and the

regular insulin is supplemented to control the glycosuria until the patient is back on a regular diet and the protamine zinc insulin that he was getting before the operation. This eliminates the danger of the disease getting out of control.

Wilder was the first to suggest the combined use of both insulins in severe acidosis or coma. One large dose of protamine zinc insulin is given in 24 hours followed by as many injections of regular insulin as are required; the requirement is determined by making frequent blood sugar tests. This combined treatment relieves acidosis and restores carbohydrate metabolism to normal much quicker than does regular insulin alone. One of the outstanding qualities of protamine zinc insulin is its ability to control acidosis. Even when the glycosuria is heavy, the urine will remain free from acetone and diacetic acid.

All observers have noticed a considerable fluctuation in the blood sugar levels and unexplainable periods of glycosuria which come and go without changes in the diet or insulin dosage, exercise or other known factors. Just what is responsible for these temporary changes or loss of control cannot be explained at present. Most of these patients soon adjust themselves without any change in insulin dosage or diet.

Mild reactions are quite common and we should be more concerned in preventing them than in controlling the glycosuria. The most common symptom is a headache present in the morning when the patient wakes up, and this may remain throughout the day or come and go during the day. The next most common symptom is a feeling of lassitude and weakness after slight exertion. Circumoral pallor is often present. It seems much easier to control the glycosuria than to prevent these unpleasant reactions which the patient experiences during the night or early morning hours. The patients have less warning of a reaction with protamine zinc insulin than with regular insulin, and it is for this reason some of the reactions become markedly severe before the necessity for glucose is ascertained. However, this delay in the appearance of symptoms affords the patient ample time to initiate treatment if he will recognize their approach. The slower action of the protamine zinc insulin frequently makes the reaction of longer duration so that it may be expected to return at short intervals after being relieved with sugar. The occurrence of nervousness, weakness, sweating, drowsiness, headache, nausea, slight mental disturbances, tingling of the extremities, visual disturbances or any other unusual sensation should warn the patient. If treatment is not promptly initiated, unconsciousness and more serious results may follow. Treatment of the reaction consists in taking about 10 grams of sugar or 100 grams of orange juice. This should be followed by some milk or bread or both, at intervals of an hour or two until the next meal is eaten. If the reaction is more severe, 10 to 20 grams of glucose should be given intravenously. When in doubt, it is better to err on the side of hyperglycemia than to take a chance on the reaction getting worse. Patients should be warned about omitting or reducing meals or taking excessive exercise unless

they take a small amount of carbohydrate beforehand.

Patients taking protamine zinc insulin usually tolerate and take higher carbohydrate diets than they previously took with regular insulin, and there is much less tendency for them to have acidosis or coma. They also have much less of a tendency to have gangrene, apoplexy and coronary disease. Joslin states that patients are probably controlled even better than they should be, particularly if their blood sugar is kept too low. Another beneficial result has been the alteration in the attitudes of the patients toward their disease. Instead of being neglectful and indifferent as many of them were to their tests, they now watch their condition more closely and expect much better results. The physician must help them by giving the best guidance and encouragement. These patients are now approaching a more normal life, their expectancy is increased and they can take their places in the economic and social places of life with much less handicap. Protamine zinc insulin is a boon to the diabetic, and is here to stay.

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Management of Squint*

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IN discussing the management of squint we are confronted with two important factors. First, it is a problem which should be considered in childhood, and second, the ideas and information as to treatment have changed, especially in recent years. Unfortunately, these two factors have not received the consideration due them, and the treatment of squint in many cases is, we may say, in the "Dark Ages."

For years there has existed laxity and misconception on the part of both the laity and profession in regard to this vital subject. How many times have you heard that "the child will outgrow a cross-eyed or wall-eyed condition?" How many cases seen early in life have been so advised by the doctor? Yet, I think it truthful to state that without treatment very few do so recover. True, a child may squint in early life and later on this is not obviously so manifest. But how many of these children have good vision in each eye? How many have binocular vision, fusion, stereopsis and depth perception? Sad to state, practically none of them.

Then, too, the oculist often has advised a long wait, especially prior to operation, and I know we have all done this. Why was this advice given? I think for two reasons: One, that the most accurate operations could only be done under local anesthesia and, hence, an age

wait was needed, and second, although known, yet until recently, very little stress was put on orthoptic treatment.

Today, with revised knowledge of eye muscle function and early orthoptic treatment, definite gains as to development of vision, both single and binocular, fusion and stereopsis have been made. The more modern operations or newer modifications of older ones are more accurate, attended with less danger, and the result can be prognosticated with greater accuracy. The use of those operative procedures plus intratracheal anesthesia has opened up a real field of endeavor in the management of squint.

The stimulation of the visual tracts undertaken early avoids amblyopia exanopsia and restores or develops vision, and the development of fusion usually follows thereafter. Will all cases so respond? No. After refraction and thorough examination one can often tell the cases which will not so respond, especially if the squint is still marked, as it is physically impossible to develop these functions when the visual axes remain at considerable variance. These cases should come to early operation, as procrastination often results in permanent non-development of binocular vision, fusion and stereopsis. This is particularly true after the sixth to eighth years of life.

Operative procedure after an eye is amblyopic practically never restores or induces good vision and if this is not present, of course, there is no resulting stereopsis.

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This is a definite loss for any individual. Further, it is exceedingly hard to keep the eye straight. There is another catastrophe to these children with squints, whether operation will or will not give them binocular vision and fusion, and this is their tremendous mental handicap. They are subjected to countless cruel remarks, often thoughtlessly made, as to their appearance and they may become introspective and timid. Later, the handicap of a squint is a real one in obtaining work, meeting strangers, and making social contacts.

To thoroughly understand this problem one must consider the etiology of squint.

From a study of the dogfish we find that from the walls of the premandibular cavity the muscle cells grow forward and attach to the eye in four outgrowths. These correspond to the rudiments of the superior, inferior and internal recti and inferior oblique muscles all innervated by the oculomotor or third nerve, this being the nerve of that segment.

From the walls of the mandibular cavity comes the rudiment of the superior oblique muscle with the trochlear or fourth nerve which supplies this head segment. From the posterior head cavity the rudiment of the external rectus arises with its supply, the sixth or abducens nerve from the corresponding segment. This will explain the separate innervation of these groups of muscles which must be considered in dealing with squint cases.

The development in the human is similar, though the head cavities have not been demonstrated.

Human binocular vision is a late development in the evolution of man. As Dr. Edward Jackson, beloved dean of American Ophthalmologists, has well said, "Strabismus is a disorder of binocular vision." To properly evaluate this problem one must turn to the development of the human eye. Earlier studies by comparative anatomists and embryologists help us in understanding this problem.

To consider the development of the human eye and, concurrently, the extrinsic muscles of the same, one must, of course, consider the development of the embryo.

You will recall that we have three primary germinal layers from the embryonic plate, that is ectoderm, mesoderm and endoderm, and in that order, the neural groove being present in the third week. The embryo is bent on itself and at the anterior end of the neural groove are formed the optic pits, which are lateral outpouchings of the front end of the neural plate. Thus quickly told, we have in order developed the primary optic vesicle, then its invagination and then the optic cup in the secondary optic vesicle. From this area the eye, orbit and appendages develop.

From the *surface ectoderm* come the lens, cornea and conjunctivae, and from the *neural ectoderm*, the retina, ciliary body, iris, optic nerve and others, while, from the *adhesions of the surface and neural ectoderm* the vitreous and lens ligament are developed.

From the associated *paraxial mesoderm* the blood vessels, sclerotic, upper wall of the orbit, *extrinsic muscles* of the eye and other structures are developed, and from

the *visceral mesoderm* the maxillary process, lower lid, etc.

The early associated mesoderm in contact with the primary optic vesicle is non-differentiated early. The blood vessels are formed first and later a cone of condensation around the optic stalk is formed at the base of the orbit. This tent-like arrangement then segments into the rudiments of the extrinsic muscles of the eye.

The early eye muscles are an undifferentiated mass at 7 mm. The separation occurs quickly and four recti and two obliques can be recognized in the 20 mm. human embryo. They start at their insertion and gradually spread proximally toward their origins.

The levator palpebrae superioris, however, forms after this stage by the separation of some of the fibers of the medial border of this superior rectus. At first it lies to the inner side, at 60 mm., but later at 75 mm. it overlaps the inner edge of the rectus and at four months reaches its final position due to growth of the muscle alone and not to rotation of the globe.

When it is realized that the levator may fail to separate from the superior rectus (which may be defective), it has a clinical significance as in congenital ptosis either with or without power of upward lid movement. This would also be a factor in vertical strabismus.

The orbicularis palpebrarum is part of the facial musculature, while the capsule of Tenon like the sclerotic is seen first in its anterior portion. At 80 mm. it is related to the insertion of the recti like a sheet of connective tissue; this grows and by the fifth fetal month the posterior part is noted.

The eyes, themselves, increase in size and weight along with the central nervous system, so that in the adult they are three and one-half times over that at birth, while the body increases correspondingly twenty-one times.

We have thus followed briefly the origin, innervation and growth of the eye and its musculature. The next factor to consider is its position. The optic pits are lateral outpouchings from the anterior end of the neural plate and the axes are in a straight line with the cavity of the forebrain. Thus, in their ontogenic alteration they must swing from an angle of 162 degrees in the 9 mm. embryo to 72 degrees or better in the 40 mm. embryo, and this is a factor in binocular vision and fusion.

The phylogenetic or evolutionary development is important and its relation to the maxillary process is a factor. In carnivorae the eyes are straight and the fields overlap. Later in mammals the maxillary process widens and the eyes swing forward, but this is not true as to the width of the skull in birds.

Man has three developments, however, over other animals: first, increase in percipient elements, second, the macula lutea, and last and most important, an elaboration of the central nervous system, so that we have a fairly primitive sense organ united with an extremely complex brain, which arrangement is absent in both the carnivorae and birds.

From this hurried review of the development of the muscles and their relation to the central nervous system,

we can see the complexity of our problem and also the reason why it occurs. Thus, lack of development or disuse of a tract to the central nervous system may result in amblyopia, as surely as may injury to the macula or other portion of the percipient apparatus. Also we note that early in infant life the head is turned to see, while later in adult life the eyes are turned. First, searching movements are performed, and later by habit and observation, parallel movements, which ultimately result in sensory-motor coördination due to the cerebral factor. These movements really are orthoptic exercises and develop fusion.

The infant at birth has fair monocular vision, preponderance of visual acuity at the macula and conjugate vertical movements. Later, conjugate horizontal movements develop and between the fifth and sixth months a desire for binocular vision is manifested; at the end of the first year a real effort is made to maintain this, and if the obstacle cannot be overcome, the image is suppressed in the poorer eye.

Again, in school life, the accommodation and convergence are fixed for near work and the defects are even more noticeable. Thus, binocular vision because of dissimilar images and no fusion, or even diplopia, is suppressed or given up. Normal binocular vision requires the aid of many complex structures.

The fusion faculty normally reaches its full development at the sixth year, and can be roughly placed in three grades: (1) simultaneous macular perception, (2) true fusion with amplitude, and (3) a sense of perspective.

CAUSES OF SQUINT

There are, no doubt, many factors that cause squint and three important theories as to the cause of squint have been advanced.

First, there is the muscle theory, that is weakness of one group or increased strength of other muscles; this is untenable. However, it may contribute as a secondary factor in some cases. Second, is the accommodation theory of Donders which has not been proven. Third, is defect in fusion faculty or Worth's theory, the most tenable. There are added factors which bear on these conditions, such as birth injuries, motor anomalies, etc.

Convergent strabismus is much more common than divergent strabismus. What occurs in a child with convergent strabismus? To have such a squint two things must be present. First, an abnormal convergence of the visual axes and second, a defect in the fusion faculty.

In the first there may be no motor defect, but the primary position of the visual axis is crossed and not parallel. How this can occur can readily be seen, as one notes the embryological development of the eyes and their movement toward the front of the skull. Similarly, a defect in the fusion faculty results in the development of fixation and visual acuity in one eye and resultant suppression of vision from disuse, that is amblyopia exanopsia in the other, with false macular projection on the periphery.

In the infant we often see spurious squint at an early age due to non-development of fusion as yet. These often correct themselves, but if the eyes cross for min-

utes at a time, or one converges while the other fixes steadily and always in the same eye, the case needs investigation.

Similarly, as heretofore noted, some children grow out of squint after puberty, but with resultant blindness in one eye and loss of central vision and fusion. These are the patients the oculist sees later in life, who make scarcely complimentary remarks as to their early eye care by their parents or physician. However, at this stage, it is too late.

These childhood squints of the convergent type are premonitory or occasional in infants, sometimes precursors of true squint, that is either the unilateral type or alternating squint. In the latter case operation helps the eye, but no fusion ever results.

Divergence is the position of rest in the eyes and when one eye is amblyopic, it diverges. In this type, myopia is most common, there being a history of high myopia usually at 10 to 12 years of age or sometimes at school these children are unable to see the blackboard, so they are put in the front seat and forgotten. Later, distant vision is blurred and they read up closely. One eye diverges on close work and later on also for distance. They usually have fusion and oftentimes turn or tilt the head, but do not have diplopia. The treatment is, of course, the exact and full correction of their refractive error under cycloplegia. Occasionally, operation by advancing the internal recti makes them more comfortable.

Another type has been called the neuropathic divergent squint. In these cases with little or no error of refraction, the trouble starts early. They have poor binocular vision and no diplopia. Fusion treatment in these cases fails; advancement of the internal recti may help.

Another type I have noted is where the errors of refraction are highly dissimilar or different. By this I mean one eye highly myopic or with astigmatism and the other one slightly so, or one with a high hyperopia, myopia or astigmatic error and the other eye the opposite kind. Vision is present in each eye and fusion is possible, but rarely maintained. In these cases, operation is palliative, but is a help from a cosmetic standpoint.

DIAGNOSIS

In briefly considering the diagnosis of squint there are many factors to be considered. I shall not tire you with familiar details, but merely enumerate some of the more important ones, keeping constantly in mind the embryology and development of the eyes.

The obvious squint is, of course, quickly noted, but whether the deviation be a primary or secondary one is not always so easy of differentiation. A careful history is important in these cases; first, that of the family as to squint and also refractive errors, then that of the patient, himself, in reference to general health, the occurrence of childhood diseases, accidents, and the existence of syphilis when paralyzes occur. Some muscle and nerve involvements are directly due to these causes; in others a latent weakness is so manifested after they occur.

We must distinguish between the phorias and the tropias and also the cases of paralysis. In these latter

cases, limitation of motion, diplopia, head tilt, sometimes nystagmus and a disproportionate secondary deviation in the better eye often occur.

In either the convergent or the divergent type the accommodative stage comes early and later, if neglected, passes into the tonic state. In the alternating types we have abnormal retinal correspondence and no binocular vision or fusion. Upon the type of squint found and the muscles primarily and secondarily affected depends the subsequent treatment and particularly the operative approach.

After ascertaining the type, the measurement of the squint is of next importance. There are many methods and the very presence of so many means that they are far from perfect. One of the earliest and simplest is that of looking at a distant object, such as a light, and holding a millimeter rule beneath the lower lid of the deviating eye opposite the center of the pupil. Close the good eye and note the second position; the difference in millimeters amounts to the deviation. This is, of course, a rough test, as are many of the strabometer tests. The corneal reflex test (of Heisberg) is also simple. The average width of the cornea is 12 mm. Now, focus a light on the center of the strongest eye. If it strikes the edge of the cornea of the deviating eye, 6 mm. deviation is present, that is 45 degrees. The tape and light measure is similar, and Priestly-Smith's modification is apparently a good one, as is the deviometer of Worth. Many of the other methods are not suitable in measuring squints, especially in young children. However, probably one of the best of the objective methods, is the perimeter method of Javal or its modification. Fix the good eye on a distant object, the deviated eye above the head rest and measure with a light on the arc where the light shines on the center of its cornea. The flat or tangent perimeter is a modification of this method. Subjective methods are the use of prisms for measuring and overcoming diplopia and deviation.

The use of many methods is recommended to establish a finding. From these a definite amount of squint can be determined and also the muscles which are involved primarily and secondarily; then with modern operative measures an accurate amount of correction can be made.

We shall now consider the treatment of these squint cases, which may be divided into two types—nonoperative and operative. The first consideration is that of determining the refractive error under cycloplegia, correcting the same, and insisting that the glasses be worn even though at times the child may look around them. In hyperopes, it is well to prescribe one-half to one diopter less than the retinoscopic finding. With the fixing eye determined and also the squinting eye, occlude the good eye. I have abandoned, except in the case of a few older children, the cover slip or frosted lens, and close the eye with an eye pad, favoring occlusion all day long. Occasionally, this has to be altered in children going to school. The use of flash stimulation with lights is also of value in establishing vision. Once the vision has been established in the amblyopic eye, if this condition existed, then an effort is made to establish binocular vision

and fusion. Most often these procedures can be carried on at the same time. This is a real problem with children living at a distance, so as much as can be reasonably done should be attempted at each visit. There are various procedures and types of apparatus to be used.

Our plan has been to start off with the amblyoscope and then use the stereoscope, telebinocular and rotopscope. Much can be done with Lloyd's campimeter and photometer or even the trial frame in case these are available and some of the others are not. We use the photometer as a matter of diagnosis and record, if they will cooperate, and at times the Lloyd's campimeter and the others as enumerated, then refraction followed by orthoptic treatment. The Keystone outfit for home drawing and Guibor's stereoscope seem particularly adaptable for home work and are not too expensive. For depth perception one can use a number of these instruments, though I find the type used for aviators as simple and good as many more complicated ones.

TREATMENT

If vision can be established, this is the first consideration; next, fusion. If no results are forthcoming, after a fair trial, then long treatment is of no avail, but if improvement is made, treatment should be continued until good fusion results or improvement has ceased. If, with correction and treatment, the squint persists and if we have been fortunate enough to develop fusion, binocular vision and stereopsis, or unfortunate enough not to, then operation should be undertaken without delay. If these factors are developed and the squint is absent with correction, then operative procedure is not needed. It is felt that preoperative treatment has helped patients and should be used. Likewise, it is often, though not always, used postoperatively.

In the operative cases the type of operation should be decided upon first and adhered to, unless unusual circumstances are present. First, let us consider the anesthesia, for this is an important adjunct. Previously, accuracy in operations was deemed possible only under local anesthesia, thus delaying operation until 12 or 16 years of age and sacrificing valuable time and losing vision and fusion by this wait. But, with better methods of anesthesia, this is no longer necessary. In using local anesthesia, preliminary medication with some of the barbiturate group, such as nembutal, is advisable; then, the instillation of cocaine four per cent and last the use of novocain along the tendinous areas, which has the disadvantage of often bulging up the tissues. I do not feel that the risk taken with retrobulbar injection is worth the trial. We have used evipal intravenously in many cases of enucleation and evisceration, but it is not lasting enough for any procedure except tenotomy and we have used this seldom of late, preferring recession.

General anesthesia, either nitrous oxid or ether, or a combination, has proven most desirable in our hands. It formerly had the disadvantage of not having the cooperation of the patient while working, but as heretofore noted, with more accurate diagnosis and mensuration, this has been found unnecessary. A further disadvantage was that the mask was a nuisance and the patient might be restless and the field contaminated.

Since our use of intratracheal anesthesia, the whole procedure has been simplified. The patient is easily handled, the field is clear and not encumbered by the anesthetist. This has been and is now our method of choice, always in children and more and more often in adults.

There are various types of operations for the correction of squint. It has been said that much surgery is still a proving ground for different technics, but not all of us have unlimited material on which to try out all the different methods, so we concentrate on certain types. Further, in the rural, middle west many of our patients come from long distances, are seen only at intervals, and only a certain amount of hospitalization is allowed and we must adjust ourselves to this situation. The whole problem has two approaches: first, to lengthen a shortened muscle, or second, to shorten an extended one. To accomplish the first, tenotomy or recession is done and for the latter, tucking, advancement, resection or the cinch operation. For paralysis or vertical deviation, other procedures will be noted.

OPERATIVE TECHNIQS

Tenotomy, probably the oldest of all muscle operations, is one of the easiest of performance and most uncertain to predicate the result. The complete tenotomy has been abandoned, though the partial and guarded have many advocates. No doubt, it still has some place, but it has been largely replaced by recession of which Jameson's is most typical, so that it is now possible to lengthen an accurate amount. The chief principle is a firm fixation of the tenotomized tendon to the sclera at a measured, definite distance back of its insertion. Some dangers have been listed, but I have found them negligible with proper care. First, there is perforation of the sclera and then infection. Proper attention to Jameson's technic obviates these dangers. Another objection has been that the muscle might be set back too far and cripple convergence. However, the muscle is rarely, if ever, transplanted back of the equator and so this cannot occur. Retraction of the caruncle will not occur, if it is left alone. Usually 1 mm. of correction equals 5 degrees of deviation. A 5 mm. recession gives 20 to 25 degrees of correction and bilateral recession of the internal recti gives 40 to 50 degrees. Recession of the external rectus muscle gives about one-third of this correction. This operation is more and more the one of our choice, to be done first in the majority of cases, and done in one or both eyes it often suffices. It can be combined with tucking, advancement, resection or even cinch operation, if need be. We often plan on a two stage operation and find that the second one is unnecessary, but, if needed, it can always be performed.

The advocates of tucking hold that it is safe and easy to perform. It preserves the original insertion and, if properly folded back, will leave no hump, even though the sutures are left in. The technic of Burch and Grant has seemed the best, though tucks can be done without instrumentation. It has seemed best for phorias or small tropias not over 15 degrees. Beyond this, other procedures have been more favorable. The closure of the conjunctiva separately with a running suture seems a distinct advantage. Objections to tucking are inability

to estimate the amount of tendon stretching, a somewhat limited amount of correction possible, even when combined with tenotomy, and possible necrosis of the muscle.

Advancement is one of the older operations. Some use this as a primary procedure alone, but the majority use it in conjunction with recession or tenotomy. It can be held in reserve, if recession does not correct. We used this for many years. All technics are modifications of Worth's. About 15 degrees is the usual amount of correction obtained. The objections are uselessness of advancing a portion, danger of scleral sutures, difficulty in suturing, and the unsightly thickening. With proper care, all except the last could be eliminated. Its advantage, of course, is the amount of correction obtained.

The majority use resection for this type of correction, and we have done so more and more of late. It does not have these disadvantages, is relatively simple and the attachment of the muscle to its original insertion is not hard. Most resections are of the Reese type, probably two of the best being the modifications of Berens and Lancaster. The first has a curved incision similar to Jameson's and a special method of suturing. The latter, Lancaster's, is a simplified modification of the shortening operation. It has certainty, accuracy and ease of operation. A longitudinal exposure of the muscle is made and marked off exactly with Prince forceps, then the special sutures inserted. With this technic, you can also fold or tuck. I have used Weiner's gold plates to hold the ends when suturing and found no difficulty and often distinct advantage with them, though I believe they could be dispensed with and I have not used them much of late. They have to be removed later, but do prevent necrosis and cutting out of the sutures. It is often hard to get satisfactory anesthesia in large resections using local anesthesia, and here intratracheal has proved of great value to us.

The last type of operation to be mentioned is O'Connor's cinch shortening operation, devised because of uncertainty of results and slipping in other operations. It is made so there are no direct sutures and no tension on sutures. In this the tendon is elevated and cut into four strips; then, hitches are placed about them using catgut or dermal in strands. There are many modifications, chiefly Hosford and Hicks' and McCool's, and the technic must be properly learned. With skill and proper instruments, the advantages claimed are shortening in the tendon alone and the avoidance of binocular occlusion. The disadvantages are the limited effect of the operation and the subsequent reaction. The latter is said to be eliminated by asepsis, but the same holds true for all operations and is not borne out in practice. Lastly, it is hard to reoperate such a case, if the occasion should arise. In the far west the advocates of this operation favor it over and to the exclusion of all others. Some of the eastern men are as opposed to it and exclude it entirely. It would seem to have a real place in the armamentarium of some as do also, of course, tucking, advancements and resections. The place of recession is unquestioned.

Other types of muscle operations noted are the myocomptor of Barraquer, used in Spain and France. It is

bloodless, well tolerated and can be repeated. The conjunctiva, tendon capsule and muscle are grasped in forceps 10 mm. from the insertion and transferred to the back of the myocampter. They are then drawn in with a screw like tuckers and the silver clips or agrafe applied and left in for three to five weeks. We have had no experience with this method. It has obvious disadvantages, but its recommendations are ease of application, non-disability of the patient, and the operation can be repeated.

Diathermy of the belly of the muscle has been tried, and injection with absolute alcohol, but they have nothing to recommend their use and these procedures have been justly condemned.

The operations of choice throughout seem to be recession for weakening and advancement or resection for strengthening. One should operate as soon as conservative methods fail, regardless of age. As to sutures outside of dermal in the cinch operation, silk has been the favorite, with catgut receiving more and more use. This is certainly preferable in recession as you do not have to remove it later.

Personally, in our section, I think recession combined with one of the other operations, when needed, is the most sensible procedure. One cannot be empirical, however, as in some cases the process is reversed. As to other types, such as tucking, cinch operation, etc., again the type you are most proficient with is the type to use, if it gives satisfactory results.

In paralysis of the external rectus, transplantation of the tendon is often done. Modifications of the Hummelsheim Method are used, that is dividing the superior and inferior recti longitudinally and transplanting their outer portions to the tendon of the internal rectus. This may be combined with an advancement of the external rectus. Weiner modifies this by cutting the external rectus 15 mm. back and splits the anterior portion. The upper half is attached to the tendon of the superior rectus and the lower to that of the inferior rectus.

For paralysis of the internal rectus, shortening is most widely accepted, while for paralysis of the superior rectus muscle, shortening or myectomy of the opposite inferior oblique. Resection is advocated by most surgeons for paralysis of the inferior rectus muscle. A recession of the inferior rectus muscle of the opposite eye is done for paralysis of the superior oblique and, conversely, recession of the superior rectus muscle of the opposite eye for paralysis of the inferior oblique muscle. In cases of both lateral and vertical deviation, correction of both may be done at the same time; otherwise, we correct the lateral first, but this is still a debatable subject and the choice still remains with the preference of the individual surgeon.

POSTOPERATIVE CARE

Postoperative care has been noted by only a few; Jameson mentions it particularly. We like to keep most of our patients two weeks. In doing advancements and resections, I think this is a good procedure to assure one of the union being firm and I still like to bandage these patients' eyes at least ten days. In recessions, of course,

the time is somewhat shorter. In tenotomies, when done alone, which we do not do, a day or so suffices. Often a patient will tell of someone who only spent a day in the hospital and was cured. However, most of these had a single tenotomy and moreover when seen later, were not cured. Tucking, when done in one eye, requires a bandage there only. This is also true in the cinch operation. I think it a wise precaution to bandage, if for no other reason than to secure asepsis, rest and promote proper healing. In cases such as those which come under the Crippled Children's Program, a maximum stay in the hospital is better, as often the patient cannot be seen for months thereafter, and follow-ups or orthopedic treatments are not allowed by their program. We have adopted the method of using iced packs on the eyes for a number of days postoperatively, usually the first night for twenty minutes, after washing out the secretion and letting out the tears. Then, this is done twice daily thereafter until there is no reaction. I am sure the patients are more comfortable and the eyes look better, since adopting this procedure.

To summarize the operative procedures, any operation in which the amount of correction can be set accurately is a good one. The one or ones selected should be those with which the individual surgeon is most familiar and with which the desired result is most easily obtained. Patients should be seen early in life and operative procedures, if needed, done early. This requires education on the part of parents, teachers and physicians.

The added factor of the better choice of intratracheal anesthesia is a definite advance along this line and combined with proper after care has simplified our problem.

CONCLUSION

I wish to make a plea for the early recognition and treatment of these cases in childhood. The proper explanation should be made to parents and teachers, so that these children may not be neglected until the time when they have developed a permanent defect which cannot then be corrected. Information should be given both to the laity and the profession that children do not outgrow squint, except with a resultant defect often worse than the squint, itself. And last, that if, after a proper diagnosis has been arrived at and a course of treatment given, the defect persists and operation is indicated, one should not procrastinate, but should use this procedure the same as any other to rehabilitate the patient without delay.

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Student Cooperation in Tuberculosis Control*

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THIS paper begins with two stories. The first has to do with my college class. We were graduated one hundred strong from Amherst in 1897. Within a year four classmates had died of tuberculosis. Since then three more have died from the lighting up of old infections. The second story deals with our neighbor in the Connecticut valley, Smith College, forty years later. In 1937 all of the five hundred entering freshmen were tested with tuberculin, X-rayed or both, if indicated. One student, apparently in perfect health, showed an incipient lesion, was hospitalized, has recovered and will enter under proper protection with this year's class. A probable breakdown under stress of college life was averted for the young lady herself; the introduction into the college community of a potential focus of infection was prevented. Did it pay?

While in the mood here is one more story in the form of a quotation from the Seventh Annual Report of the Tuberculosis Committee of the American Student Health Association. It reads: "An organization known as the Association of Medical Students has appointed a committee on tuberculosis that has recently sent to all medical schools a questionnaire aimed at ascertaining what, if anything, is being done at each institution to safeguard students against tuberculosis." This is the end of the quotation which points a cogent moral. Thoughtless youth is concerning itself with its own health in an area indifferently served by thoughtful maturity. The committee's report makes the following comment: "It has for some time been a weak point in the program of our own committee that our propaganda reaches relatively so few administrators concerned with the health coverage of graduate students."

The reference is to "graduate students," but the qualification might just as well have been omitted. This is proved by the fact that last year an inquiry sent to 819 institutions of higher education regarding student health provision commanded but 233 replies. If the three-quarters who did not answer had been really proud of their record we would have had a better response.

College administration is a ponderous task. Its momentum gathered through the centuries tends to keep it going in straight lines. This fact has merit but likewise some risk. Curriculum complexities in these modern days are among the gadflies which induce a commendable restlessness among administrators. No small number of such complexities arise as the result of undergraduate demands. Such demands are by no means always wise, yet their net result has undoubtedly been beneficial. We may well utilize more fully the growing health interest of the undergraduate to stimulate colleges and universities to provide more adequately for the protection and promotion of student health.

This policy has an historic precedent in the original objective of the Founders of the National Tuberculosis Association, to acquaint all the people with the facts of the disease, its infectious character, its preventability. No one denies that the popular clamor for protection thereby generated has been an essential element in furthering the program of control so far developed. Without informed public demand neither legislative nor financial support could have been secured nor the essential epidemiological and laboratory research carried forward.

An excellent illustration of what can be done in the matter of mobilizing undergraduate interest in health is presented in the *Daily Texan*, a student publication of Texas State University, which issued a syphilis number

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last February with the aid of the State Health Department but carried out by the undergraduate editorial board of the paper. A perusal of this slightly sensational but highly effective document raises one's respect for the potential contribution of the student body to student health.

The Tuberculosis Committee of the American Student Health Association has formulated the nucleus of an admirable program which, briefly stated, is as follows:

1. To formulate a suitable program for tuberculosis case-finding and control among college students.
2. To stimulate interest in tuberculosis through the sectional groups of the American Student Health Association, and to bring about the adoption of definite programs for its control.
3. To collect annual statistics on the incidence of tuberculosis and the results of tuberculin testing in college students.

Excellent as is this program, to me it seems a bit one-sided. It defines the duties and responsibilities of those higher up; it leaves unemphasized the duties and responsibilities of the beneficiaries. I would add a fourth objective somewhat as follows:

4. To organize the undergraduate body as an effective arm of the fighting force against tuberculosis and other preventable diseases.

In war, brains at General Headquarters are indispensable, but after all it is the well drilled and disciplined army of private soldiers that wins battles.

The Washington College Hygiene Conference report states:

"The student of today is likely to become the home builder, parent, and community leader of tomorrow and college authorities have a definite responsibility to organize and maintain a college hygiene program that will effectively assist students in preparing themselves physically, mentally and socially for healthful living, for wholesome home building and parenthood, and for wise leadership in the formation and maintenance of high standards of individual, group, and community health."

In words of one syllable this sonorous pronouncement states that the job of a college is to turn out good citizens. Despite the scientific claims of progressive education, despite the hue and cry of present-day realists, education is likely to remain an art for quite a little time to come. Its artistry lies in the due recognition of our three-way make-up — body, mind and spirit, however we may try to stress or suppress their interdependence and relative importance. The good citizen is he in whom the *right* balance prevails, in whom physique, intellect and emotion may dwell comfortably together.

Our friends, the builders of elaborate curricula in modern schools, shudder when we lay a restraining hand on the arm that is adding course number two hundred and forty in English Literature. Much as I dislike split infinitives I could stand one or two more if I thought

they indicated fewer breakdowns from tuberculosis among our over-driven and perplexed aspirants for intellectual honors.

How are we to be fair to our firm belief in the desirability of higher intellectual and spiritual education and remain true to our knowledge of the need for the protection and development of sound bodies?

The answer is not so difficult. It can, however, be formulated verbally with greater ease than it can be put into operation practically. It consists in the newer attitude toward the college, not as a place apart where the laws, customs, obligations of the vast human community are for four years replaced by a wholly different, so-called academic atmosphere of segregation and aloofness. The college world today is accepted as very much a part of the big world, with the big world's interest in politics, religion, international relations, sociology and all the other aspects of community living in our present complicated society. Among these is health, both personal hygiene and public health. This is, however, a late arrival in the company of global interests which occupy the time and attention of our undergraduates. The trend can be capitalized and it is our duty to see that this is accomplished.

At most colleges and all universities there are student publications, daily or weekly, which serve as mediums for keeping their readers in touch with all departments in the institution. A search of a number of these reveals a good bit of news and information about athletics and the physical education departments, less about the department of instructional hygiene and precious little if any about the problem of public health and environmental sanitation presented by all colleges and especially by large universities with their many thousand students. Here is a little used channel to acquaint the present and future citizen with the public health problems with which he must be familiar if he attains the stature of good citizenship. How effective this may be is illustrated by the University of Texas special syphilis number already mentioned.

In the medical departments of universities, the annual health examination of students is becoming an established activity. Colleges are following suit although organization for satisfactory work is still rather generally incomplete. The "health consultation" is an extension of this work and furnishes the wise physician an unequalled opportunity for individual instruction to students in their duties and responsibilities toward their own and their neighbors' health. Laboratory facilities are increasing and the tuberculin test, X-ray and blood examinations may be made the texts for highly valuable instruction to students and the chance to instill an interest in the personal and epidemiological reasons for their performance.

The modern college has evolved an undergraduate governing body, called by various names but acting as a clearing house for student opinion and to some extent as a disciplinary body, possessing certain legislative as well as judicial powers so far as such may be delegated to them by the college authorities. Some of these coun-

cils, I believe, have already appointed student health committees. Here is fertile soil for cultivation. To the politically responsible citizen, environmental sanitation and personal hygiene are certainly as important as the number of football games to be played in a season. The trick is to awaken this sense of responsibility in the undergraduate mind. A student health committee can act as an informed link between the undergraduate body and the medical department of the institution and properly chosen can go far toward introducing the sense of individual responsibility for community health in the miniature world of the university.

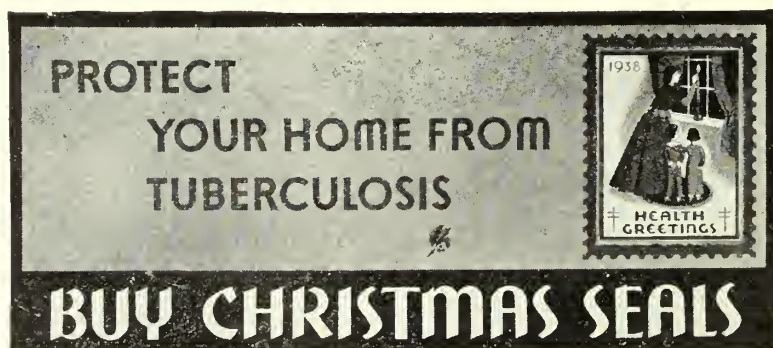
Still another such link is the faculty health committee. Regarding this agency the Washington College Hygiene Conference report has this to say:

"It is suggested that a committee on health instruction should be formed in every college and university and should include in its personnel representatives from the several departments of physics, chemistry, psychology, home economics, physical education, the social sciences, and more especially the biological sciences, including physiology, bacteriology, entomology and genetics."

To the list of scientific departments enumerated I would add the departments of Latin, Greek, Sanskrit, art, music, and the romance languages. It strikes me these need to be brought into the fold far more than some mentioned in the above quotation. In other words we are back at the old doctrine so long taught by the N. T. A. that until you include *all* the people in the fight against tuberculosis you are only playing with the problem. Members of a faculty committee who really

met and discussed their responsibilities would be driven to the necessity of concerning themselves with their own health not alone for their own welfare but for the protection of the students with whom they come in intimate contact. Inevitably this would lead to official consideration of the health of the servants, cooks, maids, waitresses, janitors, who also are an integral and important part of the college environment. This has already occurred in a college in which I am interested in New England and the first year's examination of the servants has revealed one active case of tuberculosis in a maid in close touch with the girls in one of the dormitories. The case was discovered early, has been promptly hospitalized and the patient herself is loud in her praise of the procedure and her gratitude for the early discovery and probably prompt recovery.

This, then, is my thesis. The college is a healing-in ground for the growing citizens. No citizen was ever a disembodied intellect. All interests of citizenship have their reflection in miniature in the life of a university. Primary and instinctive among these is the desire for health and physical comfort. This desire must not be allowed to displace intellectual attainment on the one hand, nor be sacrificed to it on the other. It did not pay my college to grant an A. B. to those four men who died the following year with tuberculosis. The time is ripe for the eradication of undergraduate tuberculosis. We have the necessary weapons, we have the intelligence to bring success. The next step is to enlist the enthusiasm and fighting spirit of the whole student body. With this reinforcement, we can forecast an early banishment of the tubercle bacillus from the college campus.



Chronic Recurring Sciatic Pain Due to Protruded Intervertebral Disks*

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IN recent months many articles on protruded disk, also called "ruptured disk with prolapse of the nucleus pulposus," "herniation of the intervertebral disk," and so forth, have appeared in the literature. The abnormal protrusion of one or more intervertebral disks into the spinal canal is a common lesion and frequently it produces intractable sciatic pain. A word of warning is indicated: all sciatic pain is not owing to a lesion of a disk. In fact, in the light of present knowledge, in only a small percentage of cases is sciatic pain owing to this condition. Many individuals, however, who are suffering from persistent or recurrent attacks of sciatic pain are harboring a protruded intervertebral disk, removal of which will result in dramatic relief of the symptoms.

Goldthwait,⁸ in 1911, apparently was the first in this country to direct attention to the possible rôle of the intervertebral disk in the production of symptoms of "lumbago," "sciatica," and compression of nerves within the spinal canal. Middleton and Teacher,¹² of Glasgow, in the same year reported the postmortem findings in a case in which the symptoms were due to protrusion of an intervertebral disk into the spinal canal. The work of Schmorl and Junghanns¹⁷ on the pathology of the disk is classic and their researches on the subject are without parallel; they, however, felt that the extruded disk did not produce neurologic symptoms.

Adson and coworkers,^{1,2,3,4,6,16} as early as 1922, in the Mayo Clinic performed laminectomy and removed a protruded disk which had been pressing on the cervical portion of the spinal cord with the consequent production of neurologic symptoms in all four extremities. This patient is still alive and earning his living as a barber fifteen years after the operation. This case, incidentally, was included in a paper on tumors of the spinal cord which was presented before the Seattle Surgical Society on January 8, 1925, and in which a drawing of the operative exposure of the disk was included.

In 1923 Stookey¹⁸ reported seven cases of compression of the cervical portion of the spinal cord, resulting from protrusion of cervical intervertebral disks. In 1929 Dandy⁷ reported two cases in which he had operated for protrusion of a lumbar intervertebral disk with paraplegia. He stressed the importance of trauma in the production of these lesions and the benefits to be derived from laminectomy and removal of the protruded fragments of disks. Bucy,⁵ in 1930, reported the case of a patient who had a tumor of one of the lumbar disks. This protrusion was removed and Bucy felt that the

tissue represented a true neoplasm. Hawk,⁹ in June 1936, added ten cases to the literature and analyzed fifty from previous reports.

Neurosurgeons at the Mayo Clinic have for many years removed, at the time of laminectomy, extradural fibrocartilaginous masses (figs. 1 and 2) from the spinal canal in cases in which the diagnosis was tumor of the spinal cord. It has been only in recent years, however, that we have come to look on these masses, not as neoplasms, but as abnormal protrusions of a normal unit of the spine; namely, the intervertebral disk. In 1924 such a specimen, submitted to the surgical pathologist, was reported by him to be "fibrochondromatosis of the intervertebral disk." Formerly, these patients were operated on so infrequently and so late in the course of the process (in contrast to today) that at the time of operation the clinical picture was that of compression of the spinal cord such as is caused by a neoplasm. These cases were then usually classified as extradural tumors of the spinal cord. The work of Mixter and Barr,¹⁴ in 1934, served to focus attention on these cases, and since then the condition has been recognized earlier and operation is performed before the classic symptoms and signs of a neoplasm affecting the spinal cord develop. The paper by Mixter and Ayer¹³ in 1935 again served to emphasize the frequency of occurrence of protruded disks with the production of root pain.

Naffziger and his coworkers¹⁵ recently reviewed the lesions of the intervertebral disks and the ligamenta flava, calling special attention to the anatomic factors involved in rupture of the intervertebral disks and to the prolapse of the nucleus pulposus.

The intervertebral disks may be protruded as a result of an accident or of unusual stress or strain, such as lifting a heavy object. Although any one of the disks may be protruded, those most commonly subjected to this accident are in the lumbar region of the spinal column. Of the lumbar disks involved, the fourth and fifth (lumbosacral) are most frequently the cause of the patient's disability.

The chief symptoms in cases of protrusion of intervertebral disks are root pain. Since the protrusion most often occurs in the lumbar region, the chief complaint is of pain low in the back and of sciatic pain, usually unilateral. The findings on examination frequently are scanty, but usually Lasègue's test (raising the straight leg) is positive and often the Achilles tendon reflex on the involved side is diminished or absent. Roentgenograms are of little value in diagnosis, although narrowing of the space between the fourth and fifth lumbar vertebrae, or between the fifth lumbar and first sacral ver-

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tebrae, is suggestive evidence of the presence of protrusion of a disk at that level.

The concentration of total protein in the cerebrospinal fluid obtained on lumbar puncture usually is in excess of 40 mg. per 100 cc.; in approximately a fourth of our cases the value has been less than 40 mg. Spinal subarachnoid block is a rare finding and when it is present the lesion usually has produced such marked compression of the spinal cord or cauda equina and such marked neurologic findings have resulted from this blocking of the spinal canal by the large fragment of cartilage that a diagnosis of tumor of the spinal cord is made. Because of the cases in which values for total protein in the cerebrospinal fluid are normal or low, we employ a re-

versed Queckenstedt test should be positive before the attempt is made to confirm the diagnosis. The diagnosis is confirmed and the protruded disk is identified by roentgenoscopic examination of the spinal canal, after subarachnoid injection of lipiodol through a lumbar puncture needle^{10,11}.

Five cubic centimeters of lipiodol is injected between the spinous processes of the third and fourth lumbar vertebrae. Care should be exercised to avoid extradural injection. Rarely is cisternal injection justified. During the roentgenoscopic observation of the spinal canal, search should be made for other lesions, such as neoplasm and multiple protrusions of the intervertebral disks. If, on roentgenoscopic examination of the move-

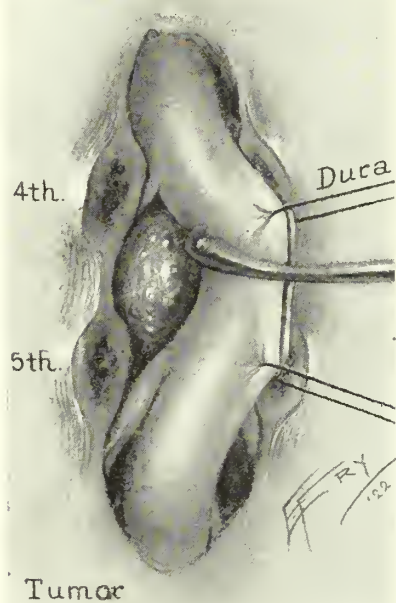


Fig. 1. Protruded fourth lumbar intervertebral disk producing bilateral sciatic pain. Removal of this protrusion resulted in complete relief of symptoms. (Courtesy of Archives of Neurology and Psychiatry).

versed Queckenstedt test¹⁰ which is very helpful in the diagnosis of lumbar protrusions. This test is based on essentially the same principles as the usual Queckenstedt test, except that the increase in intraspinal pressure in the caudal sac is produced by the extradural injection of 1 per cent solution of procaine hydrochloride whereas in the Queckenstedt test the pressure comes from within, when the return vascular circulation (internal jugular veins) is obstructed. One of the most important results of this test is the patient's reaction to compression of the cauda equina by the extradural solution. In case of a lesion involving one or more roots of the cauda equina, compression of the caudal sac produces excruciating pain in the distribution of the involved root.

The clinical diagnosis of protruded disk as the cause of "sciatica" is based on a history of trauma to the back with persistent or recurrent pain low in the back and sciatic pain, diminished or absent Achilles tendon reflex and an increased concentration of total protein in the cerebrospinal fluid. If the value for total protein is

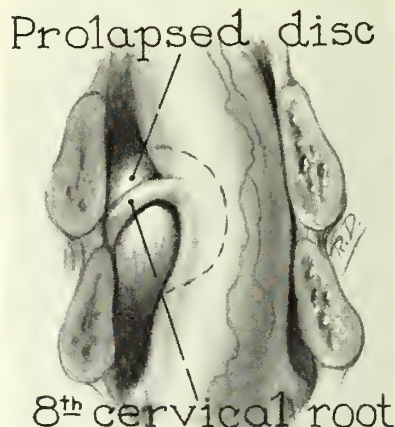


Fig. 2. Protrusion of seventh cervical intervertebral disk, showing stretching of nerve root and distortion of spinal cord.

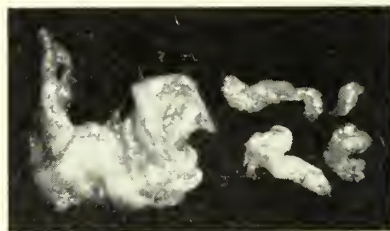


Fig. 4. Protruded portion of lumbosacral disk. The largest specimen popped out in one piece. The other tissue represents fragments of the same disk.

ments of the opaque lipiodol in the canal, a persistent defect characteristic of protruded disk is noted (fig. 3), and if a lesion at that level could account for the patient's pain, surgical removal of the protruded portion of the disk is indicated to relieve the patient.

The operative procedure consists of laminectomy and removal (fig. 4), either extradural or transdural, of the protruded portion of the disk. Removal of the spines and laminae of two vertebrae provides adequate exposure for removal of a single protruded disk; in case of multiple protrusions between adjacent vertebrae three spines and laminae are required to be removed. In one case of multiple protrusions, one of us (Love) performed double laminectomy because one protrusion was at the lumbosacral space and the other was low in the thoracic region. In performing the laminectomy, the articulating facets should be preserved. Resection of the ligamenta flava,



Fig. 3. Characteristic defect in the column of lipiodol produced by a protrusion of the third lumbar intervertebral disk; (a) prone position; (b) prone-oblique position.

which are usually thickened in cases of protrusion of the disks, affords adequate exposure for extradural removal of the lateral protrusions. If the lesion presents in the median line it is best to approach it transdurally and, in this event, wide laminectomy is not necessary. The lipiodol is carefully removed at the time of laminectomy.

Fixation of the spine, by bone graft, cast, or even by means of a belt, is not necessary following removal of a protruded disk. In our series of more than 150 cases we have not found it necessary or advisable to perform fusion in any case. The patients are treated postoperatively as if they had undergone simple laminectomy for tumors of the spinal cord. They are kept in bed twelve days, are allowed to leave the hospital on the fourteenth day and return to their homes three weeks following operation. They are advised to refrain from heavy lifting and straining for a period of three months.

SUMMARY

Protrusion of an intervertebral disk is a definite anatomic and pathologic condition. Usually it is the result of trauma which may be slight or severe. The most common symptom of such protrusion is pain along the course of one or more spinal nerves, most often the sciatic nerve.

The diagnosis is made by roentgenographic examination of the spinal canal after introduction of a radiopaque oil into the subarachnoid space. The treatment of choice is laminectomy, with removal of the protruded portion of the disk. Decompressive operations without removal of the disk are not advised.

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Practical Points in the Interpretation of the Allergy Skin Tests*

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THE skin has for many years been considered as an organ which could be of great assistance in revealing the immunologic past history of a patient. The intradermal tuberculin test has been of definite value in indicating sensitivity to the tubercle bacillus thereby denoting past or present existence of the organism in the human body. The intracutaneous Schick test has been depended upon to reveal susceptibility, if positive, and protection, if negative, to the diphtheria bacillus. The protein or allergy skin tests have contributed a great deal to the advancement of the new field of medicine called allergy. Unfortunately, physicians have accepted these tests with the same degree of enthusiasm as was the case with the other cutaneous tests. However, the skin is not necessarily a true indicator of protein hypersensitiveness. The result has been that in many instances the allergy skin tests have failed to help in the diagnosis and treatment of an allergic disease. This has led some clinicians to discard the use of the protein tests.

There has been a constant improvement in the preparation and distribution of the materials necessary for the testing, and the physician may now be robbing himself of a valuable diagnostic aid if he fails to make use of these tests in connection with some of the allergic disorders. This is especially true when help is required in determining the offending allergens or atopens in pollinosis (hay fever), bronchial asthma and some cases of eczema. Therefore, in this communication we are presenting a few practical points concerning the most important phase of allergy skin testing. The improvement in the materials has permitted clinicians to perform the tests in a more or less uniform fashion. Interpretation is still difficult and it has been stated that differences in interpretation frequently leave the management of the allergic patient in a most unsettled state.

MULTIPLE POSITIVE TESTS

Often the physician is confused by the multiple positive reactions which he obtains when a fairly large number of tests are applied. There may be many strongly positive tests, some among the ingestants, others among the inhalants, including the pollens. The question then arises as to whether all of the positive foods shall be eliminated from the diet and all of the positive inhalants exclusive of the pollens shall be removed or reduced in the environment. The age of the patient may determine the best procedure to follow. In infancy and early childhood, the food allergens are extremely important and in the latter part of the preschool period the foods and

inhalants (animal emanations) are of equal importance. There is then an increasing sensitivity to all of the inhalants during the school years. The pollens become very important at puberty. Most satisfactory results are, therefore, obtained in the majority of the cases if elimination of the positive foods from the diet is first tried in the allergic infant or young child, and removal of the positive inhalants from the environment is attempted in the older child.

Occasionally there are so many positive tests among the ingestants or the inhalants that the physician hesitates to remove all of them. In the more severe allergic cases, this may be necessary for a short period of time, following which some of the allergens giving positive tests may gradually be restored to the diet or the environment of the patient. The atopens, which experience has shown are of least significance, are first returned. In the less severe cases, the clinicians may temporarily ignore the positive tests of the least significant allergens, and only remove those of greatest potency. Table I reveals the number of positive cutaneous tests to the various allergens or atopens and the number of times these positive reactions were of definite clinical value. The more potent allergens head the list. The figures are taken from a study of the children in our clinic over the past five years.

WEAK CUTANEOUS REACTIONS

In place of many positive tests, the physician may find only a few reactions consisting of very little wheal formation with a fairly large area of erythema. These reactions may be of value for it must be remembered that the size of the cutaneous tests is not always an indication of the importance of the test. A small response (erythema) may indicate sensitivity of clinical value. This is especially true in children with allergic rhinitis, urticaria or gastro-intestinal allergy for in these allergic diseases the skin often does not become very sensitive to the offending protein. A careful correlation between the weakly positive tests and the history and observations in the allergic patient is necessary for an accurate diagnosis.

GROUPING OF ALLERGENS

For the sake of economy and simplicity, the allergens or atopens are often grouped together. Although these mixtures of allergenic extracts are only occasionally employed in the scratch or pressure puncture technique, they are quite commonly used when the intradermal testing is performed. The latter technique is the most difficult to carry out in children, and, therefore, the smaller the number of tests, the more satisfactory the results. Experience, however, has revealed that various groups

*From the allergy clinic and service of the department of pediatrics, University of Minnesota.

TABLE I
Distribution of Skin Sensitiveness to the Various Allergens

Eczema (115)*	A	B		A	B
Egg	25	15	Barley	10	—
Wheat	18	11	String bean	10	—
Milk	16	13	Mustard	9	—
Potato (white)	10	—	Chicken	8	—
Rye	8	—	Rye	8	1
Barley	8	—	Cornmeal	8	—
Peanut	8	—	Rice	8	—
Mustard	7	—	Buckwheat	8	—
Chicken	5	1	Milk	7	3
Oatmeal	5	3	Potato (white)	7	—
Sweet corn	5	—	Oatmeal	6	—
Rice	5	—	Cauliflower	6	—
Cucumber	5	—	Cabbage	6	—
Spinach	5	—	Sweet corn	5	—
Buckwheat	5	—	Tomato	5	—
Tomato	4	1	Lima bean	4	—
Navy bean	4	—	Green peas	4	1
String bean	4	—	Squash	4	—
Green pea	4	—	Asparagus	4	—
Cornmeal	3	—	Lamb	3	—
Carrot	3	—	Navy bean	3	—
Lima bean	3	—	Cucumber	3	—
Onion	3	—	Spinach	3	—
Cauliflower	3	—	Pork	2	—
Cabbage	3	—	Celery	2	—
Raisin	3	—	Lettuce	2	—
Beef	2	—	Orange	2	—
Lamb	2	—	Grapefruit	2	—
Squash	2	—	Beef	1	1
Asparagus	2	—	Codfish	1	—
Turnip	2	—	Salmon	1	—
Lettuce	2	—	Beet	1	—
Rhubarb	2	—	Pear	1	—
Chocolate	2	2	Apple	1	—
Orange	2	2	Apricot	1	—
Pork	1	—	Grape	1	1
Codfish	1	—	Raisin	1	—
Celery	1	—	Tapioca	1	—
Beet	1	—	Chocolate	1	—
Pear	1	—	House dust	31	9
Apple	1	—	Feathers (mixed)	24	22
Apricot	1	—	Horse dander	21	15
Prune	1	—	Cow dander	16	5
Plum	1	—	Sheep dander	11	—
Lemon	1	—	Hog hair	10	—
Grapefruit	1	—	Cat dander	9	3
Banana	1	—	Flaxseed	9	—
Tapioca	1	—	Dog dander	8	2
Silk	2	1	Goat hair	6	—
Flaxseed	1	—	Orris root	6	1
Kapok seed	1	—	Silk	6	—
			Cottonseed	5	—
Hay Fever (51)*			Kapok seed	5	—
Ragweed	29	24	Rabbit hair	3	—
Wormwood-sage	17	4	Pyrethrum	3	—
Grasses	15	8	Tobacco	1	—
Russian thistle	14	2	Glue (fish)	1	1
Pigweed	12	—	Ragweed	48	24
Plantain	6	—	Grasses	28	12
Dock-sorrel	5	—	Wormwood-sage	25	5
Ash	5	—	Russian thistle	21	3
Cottonwood	5	—	Pigweed	20	3
Alfalfa-clover	4	—	Plantain	11	—
Oak	4	—	Alfalfa-clover	10	—
			Cottonwood	10	3
Asthma (141)*			Dock-sorrel	7	—
Wheat	16	5	Birch	4	1
Peanut	13	1	Oak	3	1
Egg	10	6	Ash	3	1
			Maple	1	—

A—Number of positive cutaneous tests for each allergen.

B—Number of times the positive reaction of definite assistance in treatment.

*—Number of cases observed.

seem to give an unusually high number of positive cutaneous reactions of little or no clinical value. This is especially true of the vegetable and fruit groups. One of the vegetable groups is composed of cucumber, pumpkin, squash, muskmelon and watermelon, another of asparagus, garlic, onion, leek and chive. The fruit group causing the most trouble contains banana, grape, pineapple and olive. A personal communication from Dr. Ralph V. Ellis states that this observation has also been made among the University students. A chemical reaction must occur within the mixed extract resulting in a non-specific irritating substance. Steps are now being

taken to correct this condition. Meanwhile physicians must be careful in the interpretation of reactions to certain mixtures of allergens when these positive tests appear in a very large number of cases and experience begins to prove they are of little or no clinical value.

Furthermore, there are extracts containing only one allergen which are able to give a high incidence of positive reactions with very few of the tests proving to be of any value. These allergenic preparations are most misleading. Common offenders are the peanut, barley, bean, mustard and buckwheat extracts. Others have been reported. Are these preparations furnished in a too concentrated form, or are there non-specific irritants in the extracts? The question is difficult to answer at the present time. Chemical analyses are being made in some of the research laboratories. In the meantime, the physician should always note whether one or more of the allergenic extracts in his testing set gives, almost each time that the tests are employed, a positive reaction which invariably proves to be of no clinical value. Sometimes these so-called non-specific positive tests lead to more extensive reactions hours after the tests are applied. These latent reactions are usually of little significance although they may cause the patient some discomfort. The impression, however, should not be gained that all latent reactions are of no value. Some positive tests which indicate the true state of hypersensitivity of the patient may subside only to flare up many hours later producing in a few cases a condition which has been referred to as a sterile abscess, rarely requiring incision. Such a response to a protein test may indicate a high degree of specific sensitivity on the part of the skin as well as in the majority of the other organs of the body.

FALSE POSITIVE FOOD TESTS

A very interesting observation has been made concerning the many definitely positive food tests which are sometimes associated with one or two positive reactions to the inhalant allergens. Often from the history of the case and the appearance of all the tests, it is difficult to decide whether the ingestants or the inhalants or both are important in outlining the treatment of the allergic disease. In case of bronchial asthma, a simple procedure is followed in order to clarify the situation. A very careful history concerning the existence of infantile eczema is obtained. The severity and course of this skin disease is noted, and it has been observed that in patients with bronchial asthma and a history of infantile eczema, there is a very high incidence of positive food tests which are of little or no value in determining the etiology of the asthmatic attacks. The more severe the eczema during infancy, the less significant are the positive food tests obtained many years later when the child no longer has eczema but asthma.

Children with positive tests to allergens such as feathers, horse dander or some of the other animal emanations have frequently been treated successfully. Removal of the offending inhalant allergen from the environment has given excellent results without much difficulty. In some of the cases, the asthma has entirely disappeared. These patients, however, had also markedly positive tests

to egg, milk, cereals, or some of the vegetables. Removal of these ingestants from the diet has had no effect on the asthma. Such cases usually have a history of infantile eczema. Table II shows the results of our study on seventy asthmatic children. They are our most recent cases of asthma whose ages ranged between 4 and 12 years. This age period represents the time in the child's life during which ingestants and inhalants can be of equal importance as the cause of allergic manifestations.

TABLE II
Influence of Eczema on the Value of Positive Food Reactions
in Bronchial Asthma

Seventy Children From 4 to 12 Years in Age	Positive History of Infantile Eczema		Negative History of Infantile Eczema	
	No.	Per Cent	No.	Per Cent
Grouping according to history	40	57.2	30	42.8
Positive food tests	29	72.5	22	73.3
Food tests of no clinical value	25	86.2	8	36.3
Food tests of clinical significance	4	13.8	14	63.7
No positive food tests	11	27.5	8	26.7

Forty patients of the 70 cases of asthma had a definite history of infantile eczema. Of the 40 children, 29 or 72.5 per cent revealed markedly positive reactions to foods, but the positive ingestant tests were of significance in only a small number of patients. Four children or 13.8 per cent appeared to be clinically sensitive to foods. In these cases, inhalants were also of value, the children having the most improvement in their asthma, when both the foods giving positive reactions were eliminated from the diet, and the inhalants yielding positive tests were removed from the environment. The remaining 11 cases of the 40 original patients with a positive history of eczema gave negative cutaneous reactions to all of the ingestants.

Thirty children of the 70 cases gave a negative history of infantile eczema. Twenty-two or 73.3 per cent of these patients had positive food tests and these positive reactions were of definite clinical value in 14 children. This was 63.7 per cent of the total number of cases with skin sensitivity to the food allergens which was a much higher percentage than that found in the similar group with a positive history of infantile eczema. Most outstanding, however, was the observation that the ingestants were definitely more important than any of the positive inhalants. The remaining 8 cases of the 30 original patients gave negative skin tests to all of the foods. Further observations may add greater significance to the supposition that positive ingestant reactions are of little value in the older children with an allergic disease such as bronchial asthma when there is a history of infantile eczema.

CONCLUSIONS

With the improvement in the preparation and distribution of the allergenic extracts, the interpretation of the allergy skin tests remains the most difficult part of this diagnostic procedure. A few practical points which may assist the physician in the proper interpretation of the tests he performs are as follows:

1. In the presence of multiple definitely positive tests among the ingestants, inhalants and pollens, consider the fact that in infancy and early childhood, the food allergens are extremely important; in the latter part of the preschool period, the foods and inhalants (animal emanations) are of equal importance; and in the school years, there is an increasing sensitivity to all of the inhalants with the pollens becoming very important at puberty in the majority of the cases.

2. If weak cutaneous reactions are obtained, they may indicate sensitivity of clinical value especially in children with allergic rhinitis, urticaria or gastro-intestinal allergy, for in these allergic diseases the skin often does not become very sensitive to the offending protein.

3. Grouping of the allergens in order to simplify the skin testing may result in mixtures which contain non-specific cutaneous irritants as a result of chemical reactions. Some extracts of a single allergen also are suspected of having a non-specific irritating substance.

4. The so-called "false positive food tests" which are frequently found in some allergic diseases, especially bronchial asthma, are closely related to a history of infantile eczema. Those children who have had eczema, tend to have positive cutaneous reactions to the ingestants, and these positive food tests are of little or no clinical value. More studies are necessary in order to make this observation an unquestionable factor and a time-saving measure in the interpretation of allergy skin tests and the outlining of the treatment of allergic diseases.

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Infant Feeding*

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INFANT feeding of today is considered on a different basis than it was a decade or two ago. Although it may seem more complex a problem to some of you, it has in reality become more simple and far more exact than it used to be. Numerous factors have contributed to bring this about, outstanding among which are:

1. An understanding of the influence of the constitutional make-up of infant or child upon feeding, food reactions and nutrition.
2. A more exact knowledge of the composition of food and the dynamic action of its different components and the use of this knowledge in a specific application to any given feeding problem.
3. Better understanding of the effect of parenteral influences such as infection, dehydration, etc., upon feeding, reactions to food and nutrition in general.
4. Better understanding of environmental influences upon the child, behavior to food intake, feeding habits, etc.
5. Better understanding of metabolic functions of the young growing organism, due to the great advances and contributions physiology, biochemistry and pathology have made in this field.

The practitioner of today must be conversant with these factors and make practical use of them. If he can and will do this it will take the perplexing element of empiricism out of infant feeding and place it on an exact scientific basis. He will have definite specific reason for his procedures and will have assurance of results which he may expect and can with reasonable certainty predict.

The constitutional make-up of the infant is of great importance. Heredity plays a great rôle in it. Neither the plethoric, obese, quasi endocrine deficient infant, or the reverse—the thin, hyperactive, neurolabile infant will behave in its feeding and food reactions like the normal infant. The one is hypoallergic; the other hyperallergic. We must consider the great factor of constitutional disease. The infant affected with syphilis or tuberculosis is always a feeding problem and does not respond well to even the most ideal feeding regime. The same thing is true of the infant with cerebral disorder, be it agenesis or due to birth trauma or later encephalitic processes or acquired cerebral disorder. It is now generally recognized that the factor of parenteral infection looms very large as a factor which influences infant feeding and can create no end of serious problems and be a chief obstacle in the successful management of a given case. The importance of the environmental factor is becoming increasingly important in our present day complex civilization and mode of living. It has and is increas-

ingly having its repercussion in the nutrition of the young.

Bearing in mind some of these important factors we may consider the feeding of the infant both by natural and artificial means or a combination of both. The great biologic fact that the milk of every mammal is specific for its young, holds also for the human infant. We must not lose sight of this fact nor easily abandon this concept. A mass of experimental data gathered both from the animal and the human organism have taught us that specific milk as a sole food is adequate for only a comparatively short period in the human infant, apparently only about four or six months, and must then be supplemented by other food in order to meet the nutritional need of the growing organism. It has taught us the other important fact that the dietary of the expectant mother is of the greatest importance in assuring the infant of proper mineral deposits and reserves, both to give him the right start and to supply him with the needed elements during a period of deficiency of important elements, i. e., iron, until he reaches the period when such elements are contained in his supplementary food.

BREAST FEEDING

Breast milk is the ideal food for the young infant. Aside from the essential nature of its specificity which is unknown, it has some known outstanding characteristics. It is practically always free from bacterial contamination and passes at optimal temperature from mother to child. It remains nearly liquid in the infant's stomach and coagulates with a fine flocculent curd. These are important factors in its motility and digestibility. It contains the essential food elements in natural and ideal proportions both as to quality and quantity. The fat of breast milk on account of the fineness of its globule and its composition, over 50 per cent triolein, is more easily absorbed and digested than the fat of the milk of other mammalian species. The protein is made up predominantly of lactalbumin, a protein which nearly approaches the composition of body protein. The casein of breast milk also has some physicochemical properties which make it more acceptable to the metabolism than similar casein of other milk. The sugar is similar to that of all other mammals, is present in high amount and is the most constant component of breast milk. The mineral salts are more readily absorbed and utilized than the mineral salts of milk from other mammals. They are usually entirely adequate up to the fourth or sixth month of the infant's life. Breast milk contains all the vitamins that are essential in early infancy, both as to kind and quantity provided they are contained in adequate amounts in the mother's dietary. Colostrum, the breast milk of the first three days of the breast-fed infant's life, differs from established breast milk and ap-

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parently has several advantageous characteristics suited to the infant's earliest needs. It has generally about five or six times as much protein as established milk, nearly twice as much mineral salts and only about half as much fat and sugar as later breast milk. It is especially rich in sodium and phosphorus. It contains the large colostrum bodies which seem to be polymorphonuclear leucocytes for the purpose of carrying off excess of fat from a breast showing milk stasis.

Is human milk an adequate food during infancy? Yes—if the mother's diet is well balanced and adequate, but even so it is adequate only for about five or six months. After that period the infant's organism will require elements—important minerals such as iron, calcium, phosphorus—which mother's milk or any mammal's milk will at that period not contain in sufficient amount and of which the infant's organism itself has not sufficient reserves. Breast milk is, in fact, not even quite adequate after the first month or two of life as a sole food for the infant, especially not in vitamins and often not in iron. For this reason, cod liver oil and orange juice are added, and for this reason iron-containing foods such as vegetables are given as early as the infant can digest and utilize them. Vitamins are not synthesized in the body of either mother or infant. The mother can convey them to the baby only if she receives an adequate amount in her diet. The importance of the nursing mother's diet and her need for sunlight and fresh air among other things at once becomes apparent.

The first two weeks of life are a very critical period for the infant and one in which the practitioner's ability or inability to solve the various problems which may arise, will mean success or failure as far as successful breast feeding is concerned. It is a question of establishing adequate breast secretion and getting the infant to nurse. If the "coming in" of the milk is delayed too long or one waits too long for it, the infant with his labile tissue water content will lose too much, will face the danger of dehydration and become so enfeebled that he will be quite unequal to any kind of nursing. The familiar inanition fever of the newly born is a result of this happening. The mother's breast will not function adequately and have milk secretion properly stimulated unless it is emptied periodically from the beginning. Her mental state may be a contributing factor. It is obvious that a difficult situation presents itself at the outset. The solution is fairly simple. The normal newborn baby that is on the breast alone, that is not vomiting and has no diarrhea and is not gaining weight after the third day of life is not getting enough to eat and should be given more. What breast milk the mother has should be obtained by manual expression or breast pump or from other sources, or a reasonable amount of artificial food suitable for the newly born infant should be given.

If the infant takes the food poorly or refuses it, resort must at once be had to the tube. It is equally important to combat the dehydration by the subcutaneous use of fluids such as Ringer's Solution or normal salt. Inanition fever will disappear like magic. The infant will take on new vigor and must then at once be returned

to the breast. Unless the obstacle or hindrance to nursing is quite unsurmountable, adequate breast feeding will be established. Water, the infant should have freely from the beginning. He is almost surely in trouble if it is "withheld." In my own experience it has seemed wise to begin attempts to have the baby take the breast about twenty-four hours after birth. The lazy nurser is a problem and much chicanery and ingenuity must be resorted to in order to persuade him to take the nipple and really get to work. In difficult cases, I have for short periods resorted to the tube until the infant had gained more and showed more vigor and interest in his surroundings. The four-hour interval feeding is generally accepted now as being the best and one that assures optimal functioning of the breast and comfort, satisfaction and good gain for the baby. It is not obligate and there are often instances in which a three-hour interval serves very well, i. e., a mother with very sensitive nipples, when only one breast at a time should be given, or an infant with relatively small capacity for milk volume. The return to the four-hour interval can almost invariably be established by the second or third month or sooner. An unequal nursing period for both breasts (fifteen minutes on one and five on the other, alternating) has in my experience proven the most satisfactory. No nursing period should exceed twenty or at the most twenty-five minutes. Nursing periods may be shorter if the infant gets an adequate amount. It is the amount he gets which in the end counts and determines the length of nursing period. Anything over twenty-five minutes is pure loafing. The only accurate index to what he really gets is the balance. If the expected and required gain lags or fails, the balance will give the true answer in the case of failing breast secretion. How to stimulate breast secretion so that an adequate amount is given or what is even more important and more difficult, the re-establishment of secretion in a failing breast is a perplexing problem for the practitioner.

The best stimulant to the breast under any circumstance is a vigorously nursing infant. The next best stimulant without question, in my opinion, is regular complete emptying of the breasts by manual expression. It is far superior to all mechanical means, such as breast pumps, electric or otherwise, and if skillfully done is less painful. Even the most severely fissured nipple is no hindrance. It is often an excellent maneuver to elevate inverted nipples and make eventual nursing possible. The maneuver is extremely simple and is carried out by placing the thumb and forefinger, one on either side of the nipple just outside or a short distance behind the border of the areola, squeezing downwards into the breast and then pressing slightly forward at the same moment compressing the areolar tissue held between the two fingers. It is not necessary to go far back on the breast, and the procedure should at no time cause any distress. Practically complete emptying of the breast can be accomplished by this procedure. Along with other measures it ranks next to the nursing infant—as the best means to stimulate breast secretion or establish it in the failing breast. It has the added advantage that the mother can learn it and become very adept in it. The

obstetricians raise the objection that this procedure favors the development of mastitis. I have never seen it and doubt whether there is any danger if the procedure is skillfully carried out.

Additional food should be given during nearly all of the first year no matter how abundant the mother's milk is. Babies can digest and thrive comfortably and well on a much wider variety of foods and at a much earlier period than was thought possible only a few years ago. The tendency now is to give solid food in addition to the nursing and give it in fairly liberal amount and early. The infants so fed seem to thrive better and are more free of disabilities and digestive disorders than those not so fed. It is almost certainly a question of supplying valuable elements such as needed minerals and the various essential vitamins. Orange juice and cod liver oil are the earliest additions, followed rapidly by cereals, breads in dextrinized form and vegetables. Egg yolk can be an early addition and liver at the end of the first year. Meat in very finely divided form may also be added at this period. It is well to avoid too fine a comminution of foods, especially vegetables after the first year. It is seldom necessary in our present day feeding regime to continue breast feeding beyond the first year. Nutritional disorders in the breast fed infant are generally not of a serious order, but they may be troublesome and a real problem to the practitioner. Breast milk is unique in that it alone is specific in both health and disease. In the latter it is practically our last line of defense and is the sheet anchor if we are really in the dangerous waters of advanced malnutrition or athrepsia. While one can reasonably argue that the chief cause of malnourishment in the breast fed infant is undernutrition, there are other possible causes. If the baby does not thrive normally on breast milk it is in all probability due to one or the other or a combination of the following causes:

1. The baby is strictly underfed. It gets too little food.
2. It is overfed. It gets too much food.
3. The milk is not suited to the baby—there is a dyscrasia or an allergic state inherent in the infant resulting in peculiar response to an otherwise perfectly suitable breast milk.
4. There is some condition outside of the gastrointestinal tract that hinders good nutrition.

The symptoms of underfeeding are very classical and easily recognized. They are: the lack of gain, the peculiar stool, the absence of vomiting, the progressive enfeeblement and gradual dehydration preceded by a period of marked irritability and quite constant crying. It is a picture few practitioners will miss. The balance will tell the tale and the treatment is very obvious. The mother needs probably as much attention as the infant. It is a question of supplying adequate food of adequate composition and restoring tissue fluids. Overfeeding is rarely a serious problem. Again it has a train of classical symptoms, such as spitting, regurgitation or vomiting commonly without the symptom of colic, looseness of the stool, average gain or cessation of weight increases—seldom weight loss, much restlessness and crying, often

probably from hunger if a large part of the feeding is regularly regurgitated. The balance will again tell the tale and the treatment is obvious and usually simple.

A much more troublesome problem is the allergic infant. He may be plethoric, obese, the exudative type showing early evidence of eczema, but commonly is the thin hyperactive neuro-labile type, usually the offspring of antecedents of a similar type. The intellectuals furnish a large part of this group. The infants are commonly thin, scrawny, with bushy erect hair, tireless, restless, sleepless little creatures. Even small amounts of breast milk often cause almost immediate food reactions, expressed as the symptom—colic. There may be spitting, regurgitation or vomiting; most commonly it is mainly meteorism which causes the abdominal distress. The acute gas distention causing momentary severe pain, is relieved only with the passing of gas. The baffling part of the problem is the fact that even very small amounts of breast milk, amounts utterly inadequate to nourish the infant, will bring on the symptoms. It is without doubt the commonest cause of weaning. These infants are constitutional problems and inheritors of an allergic state or disposition. Eczema, asthma, and all the train of allergic conditions are often latent or manifest in the antecedents. If weaning is not immediately considered, and I believe it should not be, the problem can usually be solved by reducing the breast milk to a minimum at each feeding and complementing with fat-free acid milk mixtures. My preference is for buttermilk or skimmed lactic acid milks or skimmed processed milks to which casein is added. One of these measures will generally be successful. The mother's breast milk secretion must be maintained at full capacity by manual expression. If this form of feeding can be continued to the third month the tide will change. There seems to be a tendency for the allergic state to subside or to be definitely modified at that time and increasing amounts of breast milk begin then to be tolerated. These infants are the most grateful subjects for the early feeding of additional foods, especially cereals, fruits and vegetables, continually keeping breast milk and for that matter any other form of milk low, and giving increasingly larger amounts of solid food. No other type of breast feeding disorder so taxes the practitioner's patience and ingenuity in resolving what becomes to the parents an almost intolerable situation. Parenteral conditions except those of a psychological order or on an environmental basis, are quite rare and play a minor part in breast feeding disorders. They usually involve organic conditions in the infant such as congenital defect or mental conditions, or chronic constitutional infections such as syphilis or tuberculosis.

The feeding of the premature infant or one who through excessive weight loss from one cause or another has approached premature level, is different from that of the normal breast-fed infant in only a few respects. Breast milk is really the only food to be considered. It is the only food which will insure success and salvage of a precarious nutritional problem. It is almost always well tolerated and seldom gives untoward reactions allergic or otherwise. A frequent feeding interval and a very

small volume at first, often given with the tube, are in order. As the infant gains, the feeding interval is lengthened, the volume steadily increased and the tube no longer used. This type of feeding coupled with meticulous observance of the other important factors in the care of the premature, such as proper temperature and humidity maintenance, the minimum amount of handling, the use of oxygen when needed, and the occasional use of blood intramuscularly or by vein, will give gratifying results in the rearing of the premature or the athreptic infant.

ARTIFICIAL FEEDING

The artificial feeding of infants in the sense of successful feeding from earliest infancy, without the use of breast milk, is a matter of very recent times. Up until quite recently the problem has seemed very complex and chaotic due to the fact that most artificial infant feeding was on purely an empirical basis. The goal of all effort has been to adapt the milk of a foreign species to the human infant. The complex chaotic state of artificial infant feeding is now gone and has been replaced really by a mass of simple procedures. Complicated mathematical calculations are no longer used. It is largely a question in any given case which simple method of feeding to choose from a large constantly increasing array—all leading to the same result, and differing mostly in substance and not in principle. The newer knowledge of nutrition has, on the one hand, led to much of the simplification of artificial infant feeding; on the other, it is beginning to add and to introduce so many new factors all seemingly of great importance in successful nutrition that the subject is again becoming more complex. I remind you of the newer facts and findings, revealed by biochemical and physiological investigation with reference to important minerals and the whole subject of vitamins.

The earliest attempts at artificial feeding consisted in substituting the milk of some other mammal for that of the human. The cow, goat, ass or mare were chosen, partly for geographic and economic reasons, partly for assumed superior therapeutic reasons. The use of milk of some form or other is still basic and forms the starting point of all artificial feeding. The use of whole unaltered cow milk tried in the early beginning of artificial feeding was not at all successful, probably partly due to the fact that it was given in too large a volume. Since the era of concentrated feeding, if given in comparatively small volume, it can be used with reasonable success and is now enjoying moderate popularity. The milk dilutions followed the use of full cow milk. They proved to be acceptable, but did not adequately provide for the caloric needs of the infant until sugar and other carbohydrates were added. These equalized the loss in nutritive value due to dilution. In the average normal infant, this is the basic formula used today except that there is a definite tendency to concentrate the food and give what approaches full strength cow milk at a comparatively early age. The advent of bacteriology, the deeper knowledge of the chemical and physiologic behavior of human and other milk, the discovery of the importance to growth of many indispensable minerals, the discovery of the dynamic effect and the indispensable

need of the vitamins, the newer knowledge of important metabolic functions of the organism, especially of water metabolism—all have contributed to make artificial feeding of the present day an exact science. Much is known about foods, their composition, and the utilization of their various components when introduced into the organism. Armed with a reasonable equipment of this type of knowledge and making practical application of it, the practitioner of today can with confidence and assurance of success undertake the artificial feeding of the infant.

Cow milk has very essential differences from breast milk. Introduced into the infant's stomach, usually after considerable delay, it forms through massive coagulation an almost solid food—of fairly low motility and much slower digestibility than breast milk. It is never as clean or sterile as breast milk. Cow milk differs from breast milk in the proportional representation of the fats, in the amount of sugar and in both the amount and proportional representation of the proteins and the salts. Cow milk has a much higher buffer value—the capacity for neutralizing stomach acids—than has human milk. Vitamins are present in human milk under optimal conditions—not so in cow milk where they may be much reduced or destroyed before the milk gets to the baby. Physiologically cow milk differs in many ways from breast milk in the nutritional economy of the infant. The fat of cow milk is not as readily and fully utilized by the infant as is that of breast milk; the higher palmitin and stearin content are one factor. The relationship of carbohydrate and fat is not as optimal, at least for the infant, as it is in breast milk. The proteins of cow milk and of human milk present notable differences. Lactalbumin exceeds the casein by almost 50 per cent in human milk; whereas in cow milk there is only about one-sixth as much lactalbumin as casein. The protein content and composition of cow milk is not harmful to the infant. Quite to the contrary, it has been made use of in the treatment of certain fermentative diarrheal disorders on account of an antagonistic action which proteins have to fermentative action of carbohydrates. The salts or minerals of cow milk are about three times as abundant as those of human milk. There is about seven or eight times as much phosphate and four times as much calcium, but only one-third as much iron as in breast milk. There is in general less rapid and full utilization of the minerals of cow milk as compared with that of human milk. The low iron content is important.

Nutritional anemia will readily develop on any exclusive milk feeding beyond the fourth or sixth month of the infant's life but it will develop especially rapidly in the infant on cow milk alone, especially on diluted mixtures. The more concentrated mixtures are better in this respect; but, additional iron should be furnished as early as possible from other sources. Phosphates are seven or eight times as abundant in cow milk as in human milk and are entirely adequate to meet the important functions of contributing to the building up of protoplasm, bones and teeth and the maintenance of acid-base equilibrium. The calcium is less readily utilized from cow milk than from human milk. Its higher con-

tent in cow milk can, however, be turned to advantage by the addition of vitamin D in the form of cod liver oil or other fish oil concentrates. There are many simple ways of feeding normal babies with about equal success. The percentage of the ingredients of a food mixture are entirely unimportant today. One should roughly know the caloric value. It is important to know the composition of the mixture, and its effect on account of such composition.

Cow milk, with some carbohydrate added, still forms the basis of artificial feeding. Commonly the sole food during the first few months of infancy, it continues to form an essential component of the food during later infancy and throughout childhood. About $1\frac{1}{2}$ to 2 ounces per pound of the infant's weight is the adequate amount for good nutrition. The total amount taken should generally not exceed a quart a day. The feeding of highly concentrated mixtures or even full strength cow milk, unmodified in any way, is of doubtful value and often very unsuccessful in the very young infant. He does not have the tolerance for some of the components given under such circumstances in excessive amounts. With small volume and high concentration one may succeed and often does succeed very well if the milk is in any way processed as is now commonly done. With unmodified cow milk some dilution of the milk is better in very early infancy. A real advance in infant feeding has been the greater concentration of the food. There is no question that in the earlier days of liberal milk dilution, we often favored veiled starvation and surely had mineral and vitamin deficiencies in the picture on account of the prolonged use of wholly inadequate mixtures. The choice of carbohydrates to be added is not so important in the normal infant—practically all of them are relatively safe if one keeps well within the infant's tolerance. Their choice and the amount in which they are given becomes exceedingly important in the infant suffering from acute gastro-intestinal disorder and many of the chronic forms. The addition of dextrins to sugars such as maltose seems very advantageous. It is the combination primarily present in Karo corn syrup. Honey should be a very useful sugar on account of a natural combination of two very easily metabolized monosaccharides. A study I have recently carried out shows that the infant utilizes it about as well as dextrose.

Cleanliness of the milk fed is an absolute essential. This is ideally exemplified in certified milk. This is expensive milk and is, with our present laws and regulations regarding milk production and sanitation, hardly necessary. It is certainly true that at the present time infants can be fed as successfully with a good grade of pasteurized or unpasteurized milk as they can with certified milk. The boiling of milk for a short period—especially if it is raw milk—is a good procedure and should be generally practiced. It has several distinct advantages. The hard, large casein curd which is so characteristic of cow milk when it coagulates in the infant's stomach becomes finer, more porous and flocculent when milk has been boiled and resembles more the curd of breast milk. It becomes more digestible. The milk is made nearly safe from a bacteriological stand-

point. The peculiar features of cow milk, but more than that its failure often to meet the dietary needs in minor or major gastro-intestinal disorder, has led to much modification of it and the creation of special types of milk. These are often so much more readily digested and safely utilizable in larger amount and greater concentration, that they have to a considerable extent replaced the sweet milk modifications. The lactic acid milk devised by Romninger and popularized in this country by Marriott is such a milk. It is prepared by adding lactic acid to pasteurized cow milk under proper conditions. The milk is similar to buttermilk which is really the prototype of all acid milks and is in itself, in my opinion, one of the most useful substitute milks for both the normal and the sick infant. Lactic acid milk has a low buffer value and has the advantage that it is concentrated since it has all the fat and sugar of full cow milk. It can be given undiluted to even the youngest infant and is suitable for all milk requirements throughout the first year. It is an excellent food for certain types of gastro-intestinal disorders, particularly those accompanied by excessive fermentation. Other forms of acid milk have been devised. None have become quite so popular as lactic acid milk. The protein or albumin milk devised by Finkelstein and Meyer is really an acid milk since it is made up partly of buttermilk. It has a more limited use than the other acid milks and is more specifically used in gastro-intestinal disorders in which carbohydrate digestion is at fault, but it can be used for the very young normal infant.

There are many forms of so-called one formula milk. S.M.A. is a type. They have some advantages due to their peculiar composition but experience teaches us that they have really limited use. The processed milks have been a new and fairly recent addition to the array of milk preparations used in infant feeding and in an incredibly short time have achieved great popularity. They have many advantages since they are usually bacterially clean, are very digestible and nonallergic due to high heating, are well taken and tolerated by the infant and can be given in high concentration. The youngest infant, even the premature, takes the food well. It is the artificial food commonly used in our newborn wards.

Milk other than that of the cow has been used extensively either because of local geographic reasons or for therapeutic purposes. In our own country, only goat's milk is used to any extent. Non-milk infant foods have been devised for infants that are, or are assumed to be, allergic to cow milk. They are ingenious mixtures which sometimes serve their purpose but so far have had limited use. Artificial milk mixtures are usually given in a volume varying from 3 ounces for the newly born to 6 or 8 ounces for the older infant. The usual feeding interval is four hours, but this is not obligatory. Under certain conditions a three-hour interval may be better. The early addition of semi-solid and solid food is as necessary for the artificially fed infant as it is for the breast fed, even more so. Unless it is modified or fortified, there is greater danger of vitamin deficiency and inadequate mineral content in cow milk than in breast milk.

The feeding of the infant beyond the first year involves several important points. The amount of milk given should be decreased. A pint or at the most three-fourths of a quart a day is enough. It should always be offered last. Few things, in my opinion, favor development of anorexia or poor eating habits more in the young infant than the giving of excessive volume of milk before other food is offered. It satiates the infant but is really wholly inadequate for his real growth needs. I often temporarily withhold all milk for a short time in such cases and offer only solid food. The solid food should be finely comminuted, but not too much and the infant should be taught self feeding. Regard should be had for the fundamental distribution of the principal components, 15 per cent protein—35 per cent carbohydrate, the balance, fat and minerals. It is important to appraise all food given from the standpoint of adequate mineral and vitamin content. For the malnourished infant, the protein and carbohydrate requirement is even higher than the proportions mentioned. The total caloric value must be higher. Concentration of the food accomplishes this purpose best. Important feeding habits are formed during the second year. Self selection is not adequate. I believe in intelligent direction and some feeding discipline, careful planning, and attractive food.

NUTRITIONAL DISORDERS

It is not possible here to discuss in any detail acute or chronic gastro-intestinal disorders or the varying degrees of malnutrition, in which the correct feeding of the infant is such a major problem for the practitioner. I would, however, like to touch upon a few of them to illustrate how, owing to our better and more exact knowledge of foods and feeding and the etiology and pathology of these conditions, the therapeutic feeding regime has become less of a problem than it formerly was, and how it is carried out on the basis of exact indications with food and food mixtures specifically designed to meet the situation.

A difficult problem is the persistently vomiting or regurgitating infant. If this is not wholly or partially obstructive, the feeding regime most likely to be successful would be one in which a food of low buffer value, low fat content but otherwise of high concentration in fat and carbohydrates would be given in small volume and at fairly frequent intervals. It is often necessary to resort for short periods to the use of the tube. Buttermilk, the acid milks, skimmed or the various skimmed processed milks would fill the requirement. The allergic infant who is weaned from the breast because of his seeming intolerance of it, often falls in this group and will submit peacefully to the above outlined regime.

The infant with persistent looseness of the stool, more a catarrhal type, at the most a mild form of diarrhea, is a common problem. He is persistently losing minerals and is slowly losing tissue water; there is persistent, gradual weight loss. The diarrhea is non-bacillary and not of parasitic or protozoan origin. The element of fermentation is predominant in the gastro-intestinal picture. The restoration of fluid and minerals is important but far more important is it to check the diarrhea. This

is usually readily accomplished by the use of milk containing high protein content and temporarily low carbohydrate and fat content. Buttermilk, skimmed lactic acid milk and protein milk are almost specific for this type of gastro-intestinal disorder. Fat and carbohydrate must be included in the mixture the moment the diarrhea is under control and due regard must be had for necessary vitamin and mineral intake.

The reverse—the constipated infant—is sometimes a problem. Malformation and congenital dilatation must be ruled out. It is then a question of wrong feeding. Too exclusive or concentrated a milk formula may be the cause. Rickets or some other organic disease, or constitutional infection may be in the picture. It is usually a question of bowel atony and general malnutrition of the infant. Search for the organic disease factor and if possible treat it or eliminate it. Reduce or eliminate milk feeding altogether. Strictly low fat feeding is in order, but use cod liver oil freely. Favor vegetables and fruit in the dietary and add vitamins, especially B, D and C. Use heliotherapy or ultra-violet light and if protracted, a transfusion. Severe persistent anorexia will lead to the same picture. Similar etiological factors may operate. Slow dehydration and demineralization is a big factor in these cases. Both must be met. Subcutaneous use of fluids, such as Ringer's or NaCl, given daily for some time is good. Highly concentrated liquid food, low buffer a/c no HCl, with high carbohydrate and mineral and vitamin content by mouth and with the tube must be given for some time. Cod liver oil and heliotherapy are suggested and in bad cases an occasional transfusion.

It is in the acute gastro-intestinal disorders accompanied by excessive diarrhea that the therapeutic feeding regime is important and the decision of when and what to feed is a significant feature in the successful management of the case. The important decision to make and one that is often very perplexing to the practitioner is whether he is dealing with a case of bacillary or infectious diarrhea, a case of acute intestinal intoxication, or a concomitant symptom of a parenteral infection. Careful physical inventory should reveal the latter condition. In this case the diarrheal manifestation is of minor importance and seldom becomes damaging if the parenteral condition can be successfully relieved. The decision whether the case is bacillary or of the acute intoxication type is not always easily made in the early stages. It is important to make this differentiation if possible within the first forty-eight hours. The feeding in the acute intestinal intoxication is entirely different from what it is in the bacillary type and the parenteral type. In the former the pathology is located primarily and mainly in the small bowel; in the latter two conditions, the large bowel is mainly involved. In the one there is merely intense irritation with superficial inflammation; in the bacillary type there is extensive, often destructive deep tissue invasion. In the parenteral type the bowel may not be involved much at all or if it is the lesions are of the bacillary type.

I have placed great reliance on a very simple therapeutic test to differentiate these conditions. It is a 24

or 48 hour complete starvation test, with, of course, abundant and almost constant replacement of body tissue fluids. In the acute intestinal intoxication type of case, the temperature will drop quite abruptly, the diarrhea will lessen markedly and the general toxic symptoms will improve to a marked degree. In the bacillary type no such improvement will take place. The temperature will not drop and the diarrhea will not lessen and toxic symptoms with great prostration will continue. Blood in the stool is common in this condition and is usually absent in the other. You must begin to feed the bacillary type of case after the end of the forty-eight hour period of starvation and feed quite fearlessly. There is no real intolerance to any food. Any of the mixtures commonly given can be used. It is the condition in which now, scraped raw apple or products derived from apple such as pectin, are given with considerable success. The bacillary case should be fed and fed quite liberally regardless of the diarrheal condition. If any retrenchment is made at all, it should be in the protein component as it is not desirable to produce rapidly a formed stool or even induce constipation. Carbohydrate is particularly well borne and should be added freely to the food.

The condition is very different in acute intestinal intoxication. Here, fermentation due to excessive bacterial activity and other causes is predominant. Highly toxic and irritating substances, the result of carbohydrate breakdown are in the picture. There is temporarily at least intense intolerance to carbohydrate and as a result of the excessive motility, fat is not metabolized and is largely lost in the stool. Due to excessive diarrhea, there is enormous loss of fluid and minerals and the danger of acute dehydration is the greatest menace in the case. The restoration of fluids is the first commandment. This infant also should be fed at the end of a forty-eight hour period of starvation but the choice of food is important. It must be low in carbohydrate and fat but should be high in protein since bacterial activity and fermentation is hampered by the presence of this component. Protein milk, buttermilk without carbohydrate addition, skimmed lactic acid milk are again quite specific for this condition and will usually in comparatively short time result in the formation of formed stools. Carbohydrate and fat can then again safely be added. The mistake commonly made is the too rapid return to food mixtures far beyond the tolerance and momentary capacity of the infant. *Festina lente* is indeed the adage to observe in the feeding of these cases. Under proper management, they are restored much more rapidly than

the bacillary or parenteral types and are, on account of their response to the proper feeding regime, among the most gratifying patients the practitioner will have.

In all of these conditions, the restoration of body fluids and replacement of minerals lost is by far the most important part of the management of the case and far outweighs the feeding regime.

The malnourished or athreptic infant usually furnishes most difficult feeding problems to the practitioner. It is largely a question of low viability, due to persistent tissue destruction over long periods, and essential mineral loss with added vitamin deficiency. Low blood volume and deficient circulatory mechanism are serious elements in the picture. All these factors lead to derangement and disordered gastro-intestinal function which expresses itself primarily in very low tolerance to any food, and the easy development of acute and chronic gastro-intestinal disorder. Breast milk is almost the only food to consider in these cases, although some of the artificial foods, especially the processed milks and buttermilk with high carbohydrate additions may be successfully used. Any food, even breast milk, must be given in very small volume, in high concentration and at frequent intervals. The feeding procedure in severe cases is really comparable to the management of a premature case. The restoration of fluids and minerals and the restoration of blood volume by repeated transfusions are of the utmost importance. The successful management of these cases is one of the most gratifying experiences of the conscientious and intelligent practitioner.

CONCLUSIONS

I hope I have brought out in this brief sketch the fact that infant feeding of today differs from infant feeding of yesterday in its complete emancipation from empiricism and its construction and practice on exact scientific basis. The practitioner of infant feeding today knows or should know what he does, why he does it and what result he can reasonably expect and predict. Infant feeding presumes, of course, a knowledge of all the great discoveries and real advances which have been made in the field of nutrition and the practical application of such knowledge. Equipped with this type of education and training and with the exercise of reasonable skill and judgment, the practitioner will find that no feeding problem perplexes him or offers insurmountable difficulty unless hopeless organic disease, malformation, defect or constitutional fault, places obstacles in the way.

Discussion

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When I received the assignment to discuss vitamin A deficiency, I hastily sent a letter to Doctor Schlutz asking what phase of the subject I should cover. He replied as follows: "What I particularly would like to have you bring out is the relative incidence of this vitamin deficiency in any form, mild or severe, in your clinical experience." That is quite a job for I must hastily admit

I have not had any cases that fit into this classification. Fortunately, later in the letter Doctor Schlutz added that this might require an overlapping of his subject matter and that I should cover the clinical symptoms involved in vitamin A deficiency.

I quote the summary of the article, "The Relationship of vitamin A to the Health of Infants," by J. M.

Lewis and L. H. Bareberg of New York City, which appeared in the *Journal* of the American Medical Association, April 23, 1938: "In order to obtain information on the margin of safety with respect to the vitamin A content in the average diet of infants, 51 infants were given a diet which contained approximately one-fourth the vitamin A content of the average diet and 53 infants were given a diet which contained from four to eight times the number vitamin A units in the average diet. These infants were observed for an average period of six and eight-tenths months, and a comparison of the nutritional status and the incidence of infection of the two groups was made. The results showed that there was no difference as to nutritional state or as to susceptibility to infection between the two groups of infants. It would seem therefore that the average diet of infants contains at least four times as many units as the minimum requirement, as judged by the nutritional state of infants and their resistance to infection."

Granting that this summary does not cover, by any means, the entire field of this vitamin deficiency, it nevertheless, gives support to my ideas regarding recognition of vitamin A deficiency. I have also used the usual line of propagandized vitamin pharmaceuticals in prophylaxis and have even attempted to treat cases as vitamin A deficiencies, without due proof, and without compensating results. In other words, I am benefiting a great deal by Doctor Schlutz's paper today, and will attempt the positive proof of the laboratory as soon as the methods are within reach of the usual clinical laboratory and technician. At present, I feel that our vitamin trends in medicine are going to be as important as our newly acquired knowledge of glandular therapy; but as in our glandular therapy, so many unfathomed individual reactions of the body enter into the study of vitamins, that the true picture is difficult of immediate solution.

Through the kindness of Dr. Hugh Joseph of Johns Hopkins Hospital, Baltimore, I have secured aid in presenting my clinical facts. Very little is known of the factors which influence *absorption* of vitamin A. We do know that the absorption is better on a high fat diet; if bile is not available to the gastro-intestinal tract, absorption is poor unless bile salts are given by mouth. Also, it has been shown that absorption is better in coconut oil than in olive oil. Sometimes a vitamin A deficiency results in poorer absorption of fats. This introduces us to the clinical conditions leading to poor absorption, which can be shown by the failure of blood level rise after a large dose of vitamin A. These may be briefly stated as: (1) celiac disease (2) any infection (3) chronic diarrhea and other gastro-intestinal conditions (4) pancreatic cysts interfering with proper fat digestion and (5) occlusion of the bile ducts due to any cause.

It should be mentioned here that newborn babes are very low in vitamin A in spite of any effort to give a sufficient oversupply to the mother before birth of the child. We are told, too, that the pregnant woman is normally low in vitamin A. The explanation, then, seems to be that the foetus in its capacity of blood-sucker

and parasite, uses vast amounts of vitamin A from the pregnant woman. Milk is low in this vitamin but sufficient if the newborn is not the victim of some infection or other condition interfering with the proper utilization of vitamin A. Feeding the mother vitamin A or carotene will aid materially in increasing the nursing infant's storage.

There is a great deal of evidence to show that it is very difficult to completely deplete the body of the vitamin A storage. There is very slight, if any, clinical manifestation of the lack until the depletion is complete. Too little is known of the utilization and destruction of vitamin A. There are factors, however, that do lend to ready study; cretinism and myxedema interfere with the absorption of vitamin A if the supply is primary in carotene. Hyperthyroidism promotes diminution of vitamin A, perhaps from increased utilization. Anesthetics, which dissolve fats, diminish the stored vitamin A. Decreased storage exists in infections of all types, the more chronic, the greater the reduction. Chronic liver disease, chronic valvular disease of the heart and chronic nephritis reduce the stored vitamin.

Our knowledge of what vitamin A does is very limited. What pathological changes result from this deficiency? Since the work of Wolbach, these are well known. The change takes place in the epithelial cells, causing atrophy; a flat cell, highly keratinized, appears due to this process of repair. There is a loss of ciliary function in the bronchi leading to the accumulation of secretions and a tendency to bronchitis. The mucus membranes are less resistant to the passage of bacteria resulting in bronchiectasis and interstitial pneumonia. Sebaceous gland ducts and hair follicles become clogged with horny material causing a skin lesion which is quite characteristic. Gastric ulcers have been caused in rats by vitamin A deficiency and are assumed to be so stimulated in humans.

The salivary and lachrymal glands may be affected and the cornea of the eye become diseased; this is known as keratomalacia. The pelvis of the kidney and vagina are subject to this epithelial change.

What clinically do we see as a result of vitamin A deficiency?

1. *Loss of Weight.* Where there is proved evidence of vitamin A deficiency, there is a marked loss of fat; we do not know definitely the reason for this. The loss may be due to a disturbance in the appetite. It may depend on changes in the gastro-intestinal tract leading to poor fat absorption. Fat metabolism may be affected, and this apparently is an acceptable theory. In Germany, vitamin A is being used widely to cause gain in weight even where there is no other evidence of deficiency. My own few attempts along this line have so far been flat failures.

2. *Skin Changes.* These have been mentioned before as to their cause and effect. The lesion is a horny rounded or pointed top extruding above a blocked hair follicle or sebaceous duct. This same lesion has been formerly described as hyperkeratosis pilaris rubra. Experience soon convinces one, however, that the response to vitamin A therapy is disappointing, and therefore the deficiency

as a cause is still justifiably questioned in a great percentage of cases.

3. *Eye Changes.* Xerophthalmia is a late manifestation, but it is the one clinical evidence of vitamin A deficiency that leaves no doubt. The disease has been ascribed to drying up of the lacrimal secretion and to intracranial nerve degeneration, but is now fully proved to be that of epithelial cell changes due to vitamin A deficiency. Night blindness or nyctalopia is known to have other causes than vitamin A deficiency, but when these causes have been ruled out and the case responds to vitamin A therapy, the inference should be undeniable. In the mild cases, Dr. Joseph feels that the inference cannot be applied definitely; he emphasizes the possibility of a disturbance in pigment metabolism.

Clinically the condition known as nyctalopia is used as the earliest sign of vitamin A deficiency. In children, more advanced signs of the deficiency add to the picture rapidly, but adults notice the effect earlier and so are under observation sooner. Recent observations have led the profession to believe this condition is much more widely existent than has been suspected up to now.

4. *Infections.* Vitamin A deficiency has usually been associated with infections, especially of the upper respiratory tract. Recent studies have shown the effect is on the mucus membrane, lessening the membrane's power to

resist infection spread. In turn, the infection interferes with the absorption and may increase the rate of utilization or destruction resulting in the deficiency. My attempts at clinical treatment with vitamin therapy have been very unsatisfactory here.

5. *Intestinal Absorption.* In clinical work, it is impossible to separate the effect of deficiency on absorption from the effect or failure of absorption in the presence of the deficiency. There is evidence that in vitamin A deficiency the conversion of carotene to vitamin A is impaired. Diarrhea has been attributed to vitamin A deficiency, but it is usually the diarrhea that causes the deficiency through interference with absorption, or else the diarrhea is caused by an associated deficiency.

6. *Nervous Lesions.* Vitamin A deficiency has been stated as the cause of such neurological manifestations as incoördination and peripheral neuritis. One must still question the extent the deficiency depends on the neurological lesion. It is to be remembered, too, that these same lesions have been attributed to other vitamin deficiencies.

We have loss of weight, skin changes, eye changes, infections, gastro-intestinal disorders and nervous lesions all attributed to vitamin A deficiency. "The proof of the pudding will be in the eating."

Vitamin D Deficiency in Infancy and Childhood*

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A REVIEW of the report of Dr. August Orr of the Division of Child Hygiene of the North Dakota State Department of Health for 1937, and personal communication with Dr. Orr, revealed some startling information regarding the incidence of vitamin D deficiency in pre-school children in North Dakota. His report is based upon examination of 5,227 pre-school children in 140 communities scattered throughout the state. The examinations were entirely clinical. The signs taken as indicative of rickets included both those of active rickets and deformities suggesting old rickets. From Dr. Orr's report, one can expect to find evidence of rickets in about one out of every five pre-school children in North Dakota. Dr. Orr states that only moderate or marked findings were recorded, and believes that laboratory and radiographic information would have revealed evidence of rickets in many more children. It is his opinion that vitamin D deficiency can be considered one of the most serious child health problems in North Dakota today.

Deficient intake of vitamin D or inadequate exposure to ultra-violet rays during infancy and early childhood

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becomes manifest chiefly by the development of rickets or tetany or both. Vitamin D appears to affect the phosphorus and calcium absorption and utilization by the body, and present evidence indicates that the changes noted in the body in rickets are secondary effects of a deranged calcium-phosphorus metabolism. The exact mechanism of this derangement is not satisfactorily explained as yet.

Symptoms of rickets usually first present themselves between the third and fifth months of life. The earliest symptoms are usually head sweating, restlessness, irritability and rolling of the head on the bed. The earliest physical findings are usually beading of the ribs, and poor tissue turgor. The more prominent changes such as enlargement of the ends of the long bones, squaring of the head, pot belly, chest deformities, and other changes, are manifestations of advanced rickets. Increased susceptibility to respiratory tract infection, impaired function of the digestive tract, anemia, abnormal dentition, and poor general physical condition, accompany the more noticeable changes, and are responsible for more disasters in rachitic children than are the bone changes.

A history of inadequate intake of vitamin D, inadequate exposure to ultra-violet rays, diet deficient in essential minerals, and general poor hygienic surroundings, together with suspicious symptoms or clinical findings should lead to further investigation. Laboratory procedures are valuable. Inorganic blood phosphorus determinations of below 4.0 mgs. per 100 cc. are strongly suggestive of active rickets. The blood calcium is normal in rickets, but may be considerably lowered if tetany is associated. If facilities are available, blood calcium and phosphorus determinations should be made. The status of blood phosphatase determinations in estimating the rachitic state is not settled, but recent work indicates that such determinations may prove to be of more value in this regard than the blood phosphorus findings.

Roentgenographic findings are becoming increasingly important in establishing a diagnosis of rickets. Statements by men of wide experience cast serious doubt on the reliability of the clinical diagnosis of mild rickets. Jeans states, "it would seem safe to take the stand that a clinical diagnosis of slight or mild rickets is not acceptable as evidence of this disease." Elliott says, "doubt is thrown on the reliability of a clinical diagnosis of mild rickets in the absence of roentgenographic evidence of the disease." The usual roentgenographic findings in early rickets are a frayed appearance at the distal ends of the radius and ulna, and at times an increased trabeculation of the shafts of these bones. Later changes consist of apparent absence of ossification centers within the epiphyseal cartilages, broad, irregular, ill-defined metaphyseal plates, flaring of the ends of the shafts, coarse trabeculation, and an unusually wide space between the visible ends of the femur and tibia. However, the roentgen diagnosis of mild rickets is far from exact. Experienced interpreters frequently disagree in their diagnosis of the same set of radiographs. Thus it becomes apparent that a combination of all available diagnostic methods is necessary to diagnose mild rickets, and undue emphasis should not be placed on any one method.

In considering the prevention of vitamin D deficiency in infants and children, a question arises as to what to use as a standard of adequate intake. Growth and development rather than rickets prevention should probably be used as our standard. Recent work by Jeans and his associates indicates that infants receiving barely enough vitamin D to prevent rickets do not grow as fast as those receiving larger amounts. Their work presents strong evidence that the amount of vitamin D that barely prevents rickets does not allow for optimal growth and adequate calcium-phosphorus retention. Individual variation complicates the problem. Premature babies notably require unusually large amounts of vitamin D. As with other vitamins, the individual requirements of normal infants for vitamin D is extremely variable. Breast fed babies do not seem to develop as severe rickets as do those artificially fed. Nevertheless, they do develop rickets and the administration of additional vitamin D is necessary.

The Council on Pharmacy and Chemistry of the American Medical Association recommends a dose of two teaspoonfuls of high grade cod liver oil daily, or

its equivalent in more concentrated fish liver oils. This dose supplies 600 to 700 U.S.P. units of vitamin D. Recent work by reliable investigators tends to indicate that this high a dose is unnecessary, and that 300 to 400 units daily is adequate. Inasmuch as harmful effects are not produced by many times this amount, it would seem wise to err on the liberal side. There are available numerous satisfactory preparations containing various amounts of vitamin D. Those products from animal sources appear to be more effective (rat unit for rat unit) than those from vegetable sources in preventing and treating rickets. Recent work on calciferol, cod liver oil concentrate milks, and irradiated milks, suggests that dispersion in the milk may increase the effectiveness of the dose administered.

The use of milks containing vitamin D is becoming increasingly popular. There are processed cod liver oil concentrate milks containing as high as 400 U.S.P. units of vitamin D to the quart. Irradiated milks appear to contain much less than this. While in some instances these milks alone seem to give adequate protection against rickets and even allow optimal growth, it is still advisable to give additional vitamin D. In feeding such milks, it must be remembered that whether or not the vitamin D dosage is adequate depends on the amount of milk the child actually takes, and on his individual requirements. The administration of calciferol in milk is relatively new but gives promise of being entirely adequate. Two hundred and fifty to 500 U.S.P. units of calciferol given in milk appear to be sufficient.

From clinical experience and after considering the numerous factors involved, the following daily doses seem adequate for normal infants: (1) Two to three teaspoonfuls of high grade cod liver oil; (2) Ten to fifteen drops of halibut liver oil with viosterol, or similar doses of oil from the percomorph fishes; (3) Ten to twenty drops of irradiated ergosterol; (4) Two drops of calciferol in milk; (5) Fourteen ounces of irradiated evaporated milk, plus one teaspoonful of high grade cod liver oil.

A fifty to one hundred per cent increase in the above doses is advisable in premature or debilitated infants until such time as the infant may be considered normal.

During the summer months, additional vitamin D is not necessary for older infants and children who spend considerable time in the sunshine. Unless systematic sun bathing is carried out, few young infants are exposed to enough of the sun's rays to give adequate protection.

In treating active rickets, there is probably no optimal dose of vitamin D for all cases. Individual variation is great. The work of some authors indicates that a satisfactory dose is about 2,000 U.S.P. units daily. It seems well to start with doses of about three times the recommended protective dose and raise or lower it later as indications arise. Large doses should be given for at least six or eight weeks.

Other factors than vitamin D dosage are important in treatment. It should be remembered that the gastrointestinal functions may be impaired in rachitic infants, and the preparation to be used in treatment should be

chosen accordingly. Irradiated evaporated milks and cod liver oil concentrate milks are valuable but are inadequate for treatment. Concentrated fish liver oils or cod liver oil, if large enough quantities are tolerated, are probably the most reliable preparations today. Crystalline vitamin D (calciferol) in milk may prove to be the best method of treatment. Irradiated ergosterol seems to give extremely variable results. Systematic exposure to natural or artificial ultra-violet rays is of value.

Rachitic infants are usually anemic. Treatment of the anemia with iron and liver extract improves the general condition, and frequently seems to hasten the response to anti-rachitic treatment.

The food intake of rachitic infants and children is often deficient in essential minerals. Whenever tolerated, the feeding of cereals, vegetables, and fruits to young infants, and other mineral-containing foods to older infants is recommended. Infants with active rickets should not be allowed to sit, stand, or walk until such time as the rachitic process has healed. Serial radiographic examinations are a great aid in determining when healing has occurred.

In spite of increasing knowledge of the subject, vitamin D deficiency is still a major child health problem in North Dakota. We feel that if the above measures for prevention and treatment could be universally employed, vitamin D deficiency would cease to be the serious problem Dr. Orr's report so forcefully portrays.

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Prevalence of Positive Wassermann Reaction*

With Special Reference to Railroad Employees

W. Hiemstra, M.D., F.A.C.P.

Missoula, Montana

SINCE January 1, 1928, it has been routine to take blood Wassermanns on practically every office and hospital patient examined. The statistics which appear in this article were compiled from the records of the medical staff consisting of Doctors G. M. Jennings, A. T. Haas, A. R. Foss and the author.

The Northern Pacific Beneficial Association is a hospital association formed primarily to care for all employees of the Northern Pacific Railway Company. The association has four hospitals located at various points on that railway. The Missoula hospital cares for all employees from Laurel, Montana, to Sprague, Washington. This area includes both rural and urban populations. The size of the cities varies up to about 100,000. In addition to caring for the railway employees the staff is also allowed to do private practice, both office and hospital. Hence, this report includes both railroad employees and also the general public.

* From the records of the Northern Pacific Beneficial Association Hospital, Missoula, Montana.

The Wassermann tests were done at the laboratory of the State Board of Health, Helena, Montana. Both cholesterinized and non-cholesterinized antigens were used. In recent years, the Kahn test has been used in addition to the Wassermann test. Until about a year ago all blood samples were sent in under a number only. If positive Wassermanns were reported another sample of blood was sent in under a different number. The fact that it was impossible to find a single case in which the Wassermann was returned 4+ the first time and did not check on subsequent examinations, speaks very well for the proficiency of the work done by the State Board of Health.

A comprehensive review of the literature has not been attempted. However, a few articles have been reviewed. One author reports syphilis present in 4.4 per 1,000 of the population in Philadelphia for both sexes combined. The rate for males per 1,000 was 5.29 and for females 3.51 per 1,000 population.¹ Short and Kelley² report

2.06 per cent positive Kahn tests, confirmed by Wassermann tests, in a group of 10,000 people in fairly good health who applied for health examinations. In a second group consisting of 1,000 insurance policy holders, the number was 1.8 per cent. Maxcy and Brumfield³ report 9.7 per cent positive serologic reactions in a series of 4,185 negroes. Bartleson⁴ reports as follows: "Out of a total number of 105,036 blood tests made, 11,686 were positive for syphilis, 5,182 partially positive and 5,215 unsatisfactory for examination."

Stokes⁵ quotes various authors who give various percentages for the prevalence of syphilis, some being as high as 30 per cent. In this same text, a report of the Mayo Clinic is given in which the presence of syphilis in various occupations is as follows:

TABLE 1.

Occupations	Cases	Percentages
Railroad employees	128	11.7
Laborers	243	6.1
Business men	236	3.8
Farmers	536	1.5

It is further stated that of 1,143 men examined in this report, 4.2 per cent had syphilis; of 514 women 2.6 per cent had syphilis. It is stated that in compiling these figures medical judgment rather than a routine Wassermann test was the basis of the diagnosis.

RESULTS OF PRESENT STUDY

The total number of Wassermanns taken from January 1, 1928, to July 1, 1938, was 7,528. There are 294 repeats among the negative and positive reports. This leaves a net of 7,234 tests to be reported. In the entire group there are 19 anti-complementary reports which later were reported negative. There are nine reports of either 1+ or 2+ which later were reported negative. Neither of these two groups are included as positive Wassermanns in this report. Practically all cases were of the white race. There were four children in the group of private patients. The following tables give the various data obtained in this study:

TABLE 2.

	Total Wassermanns	Number Positive	Percentage Positive
Both railroad and private	7,234	140	1.93
Railroad employees	2,658	64	2.40
Private patients	4,576	76	1.66

From the above it would seem that syphilis is more prevalent in railroad employees than it is in other groups.

However, if we compare male railroad employees with the males of all other occupations and similarly compare the females, the results are quite different, as seen in Table 3.

TABLE 3.

	Total Wassermanns	Number Positive	Percentage Positive
Female Railroad employees	84	1	1.19
Female Private patients	3,104	34	1.09
Male Railroad employees	2,574	63	2.44
Male Private patients	1,472	42	2.85

Table 4 shows the number of Wassermanns taken in two periods, each period consisting of five and one-fourth years. It will be noted, in spite of the fact that 1,200 more Wassermanns were taken during the second period, there were 8 less positives.

TABLE 4.

	Total Wassermanns	Number Positive	Percentage Positive
Jan. 1, 1928—Apr. 1, 1933	3,016	74	2.45
Apr. 1, 1933—July 1, 1938	4,218	66	1.56

COMMENT

The main purpose of this article is to compare the frequency of positive Wassermanns found in railway employees with the number found in people of other occupations. If one compares the group as a whole, it would seem that the percentage is higher in railway employees than in the other group. However, if one compares males against males, and females against females, the result is entirely different. This study indicates that syphilis is not more prevalent in railway employees than it is in the general public. The second interesting feature is the percentage of positive Wassermanns in the second five year period compared with the number in the first five year period. While this comprises a comparatively small group, the trend at least is encouraging.

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WHERE WE FAIL IN LEGISLATION

At one of our regular district society meetings recently, our program consisted of a discussion of economic and political issues. The attendance was good and the problems were attacked with vigor and intelligence. We agreed that certain legislation was desirable, even necessary, and that doctors should contact legislators before the latter convened; also, that we should have someone present at the session to represent the profession.

The meeting was about to adjourn when one of the members suggested that we had had a good meeting, but that in the past we had discussed the same subject and later found that we had accomplished very little. He proceeded to question several of the members present. They were unable to answer queries concerning names of the legislative candidates in their districts and were unfamiliar with attitudes of the candidates toward the profession. Before the meeting adjourned, we all promised to come to our next meeting better informed.

Legislators may be divided into three groups: our friends, our enemies, and those that are indifferent. Our friends can be depended upon to vote right, but will not be active in our behalf. Our enemies are aggressive in their opposition and there is little we can do to change them. The eighty per cent that are indifferent can be influenced if intelligently contacted before election. The writer's experience shows that while politicians may not keep promises made in public addresses, they generally keep promises made to individuals.

J. L. S.

THE CAUTIOUS DENTIST

En route to Chicago to attend the special sessions of the national House of Delegates, called to consider the results of the Washington, D. C., national health conference, we found a train copy of *Columbia*, the Knights of Columbus monthly, which contained a very interesting article by Father Parsons regarding this whole affair and its implications. Quite pungently he described how for centuries there were two world-wide organizations endeavoring to alleviate humanity's distress, the Church and the medical profession; but that in recent years these two bodies were undergoing some vicious and often unwarranted attacks. He discussed the topic of the Washington conferences, and in attempting to review the merits and demerits of the plans there suggested that in several instances some of the physicians were too free with their wisecracks against the proposed regimentation of the medical profession by governmental forces.

The September, 1938, issue of *Oral Hygiene* has an editorial by Edward J. Ryan, D.D.S., relative to the subject of the physician soon frying in the governmental fat or earning largess from Uncle Sam and his agencies. Part of that editorial is quoted here:

"It is unfortunate that the medical profession, which is so intimately associated with human life and human welfare, should be painted in the eyes of the public in such diabolical terms. What lesson should the dental profession take from this controversy? At present we stand clear of entanglement. We should continue to keep this detachment. *If we become too*

closely entwined with the policies of the American Medical Association, we, too, will feel the pressure of public disfavor. To be sure, the dental problem is part of the general health problem, but so long as we exist in separate professional organizations, we must maintain our identity and be free to act independently. We want, of course, to preserve our cordial and cooperative attitude toward medicine. It might be well to recall here, that in the days of its greatest glory the American Medical Association was never disposed to absorb us. We have been treated with tolerant consideration as a 'correlated profession,' rather the *stepchild* of medicine. We have never been on an equal footing with the profession of medicine. But this is almost entirely our own fault. We have been content to ride on the coat-tails of medicine for years. . . . We have been their imitators. . . . The worst thing that we could do at the session of the American Dental Association would be to take an immutable stand similar to that of the American Medical Association on the matter of health care. That would project us in the public eye in the same category as the American Medical Association—members of the 'medical trust.' "

It may not be out of place here to note that at the special sessions of the national House of Delegates, several representatives of the American Dental Association present were offered the courtesy of addressing the House, but declined.

A. W. S.

CHARITY FOR ALL

The restlessness of the medical profession in Washington, D. C., is not to be wondered at. Abraham

Lincoln's beautiful sentiment, "With malice toward none, with charity for all," is being misconstrued by our modern politicians. They are overworking the charity-for-all end of it and throwing the malice-toward-none into reverse for A. M. A. trust-branding purposes.

Westbrook Pegler in a recent column rapped the policy of giving free hospitalization to politicians at the expense of the taxpayers. It seems to be a matter of news that Secretary of the Interior, Harold Ickes, entered the United States Naval Hospital in Washington on June 1, 1937. How long he stayed is not known, but he returned to his duties on July 6th. Secretary Ickes receives \$15,000.00 a year in addition to a limousine, customarily assigned to each Cabinet member. He is reputed to be a man of considerable private wealth. Why under such circumstances he should receive examination and rest in a naval hospital can scarcely be understood or justified. By no stretch of imagination can the Secretary of the Interior be rated as a member of the Navy.

We frequently read in the daily press about high-salaried public officials being examined or hospitalized in the Walter Reed Hospital. That there are good men in the medical department of the Army and Navy we do not question, but we strongly suspect that the attraction is of a different nature.

A. E. H.

Book Notices

Synopsis of the Diagnosis of the Acute Surgical Diseases of the Abdomen, by JOHN A. HARDY, M.D., F.A.C.S., 1st edition, green cloth, gold stamped, 92 illustrations, 345 pages; St. Louis: C. V. Mosby Company: 1938. Price \$4.50.

This book is a well written synopsis dealing with the diagnosis of acute surgical diseases of the abdomen. While the author is primarily concerned with a detailed concise presentation of the clinical findings by examination and observation of the patient, every proven laboratory and X-ray aid in diagnosis is also considered and suggested. In forty-one short chapters, the various acute surgical conditions of the abdomen are considered as to etiology, history, physical examination, signs and symptoms, laboratory aids to diagnosis and differential diagnosis. The illustrations are diagrammatic to emphasize the important points. This book should be of value not only to students and practitioners of surgery, but to any general practitioner who has occasion to see cases of acute surgical diseases of the abdomen.

Endocrine Therapy in General Practice, by ELMER L. SEVRINGHAUS, M.D., F.A.C.P., Professor of Medicine, University of Wisconsin, Madison, Wisc. 192 pages. Chicago: The Year Book Publishers, Inc.

In contrast to the many theoretical books on endocrinology which have been appearing recently, Dr. Sevringhaus' volume on *Endocrine Therapy in General Practice* sounds a real practical note. The aim of his volume is to assist practicing physicians in prescribing more rationally newer and more potent endocrine products. The biological significance of hormones is first discussed. Immediately following is a systematic study of

all the glands of internal secretion. A short chapter is given over to the posterior pituitary body. The greater bulk of this small volume, however, is descriptive of the anterior pituitary group of hormones and their stimulating action upon the thyroid, parathyroid, mammary glands, pancreas, adrenals, ovaries and testes. The last two chapters are descriptive of miscellaneous endocrine activities and obesity.

Dr. SEVRINGHAUS is very careful to offer in his preface a wise statement; namely, that this volume will in some respects be out of date almost as soon as it has been crystallized into printed form.

A Synopsis of Genito-Urinary Diseases, by AUSTIN I. DODSON, M.D., F.A.C.S.; 2nd edition, green stiff fabrikoid, gold-stamped, 284 pages plus index, 112 illustrations; St. Louis: C. V. Mosby Company: 1937. Price, \$3.00.

These Mosby *Synopses*, being handy texts for the medical student, and worthy reference sources for the physician, are very completely done and attractively produced. This one, *Genito-Urinary Diseases*, is now thoroughly up-to-date, with many important revisions. The author, who is professor of genito-urinary surgery in the Medical College of Virginia at Richmond, deserves congratulations on a good job.

Pneumonia and Serum Therapy, by FREDERICK T. LORD, M.D., and RODERICK HEFFRON, M.D.; 2nd edition, maroon cloth, gold-stamped, 126 pages plus appendix & index, bibliography in pagination, 10 tables & 10 figures, one halftone illustration; New York: The Commonwealth Fund: 1938.

Since many advances have been made in treating pneumococcus pneumonia with specific anti-serum since this book was first published in 1936, a new edition was strongly indicated. Much new material has been added to this competent handbook. The senior author is clinical professor of medicine (*emeritus*) in the Harvard Medical School; Dr. HEFFRON was field director of the 1931-1935 pneumonia study and service of the Massachusetts Department of Public Health.

Societies

SCIENTIFIC PROGRAM OF THE MINNEAPOLIS CLINICAL CLUB

Meeting of April 14, 1938

D. D. Turnacli, M.D., Presiding

A SEVERE CASE OF FACTITIAL PROCTITIS FOLLOWING IRRADIATION

H. W. CHRISTIANSON, M.D., F.A.C.S.

MINNEAPOLIS, MINNESOTA

Factitial proctitis, from irradiation, was thoroughly discussed by Drs. Buie and Malmgren in 1930. The cases reported and described were due largely to the radium used in treating carcinoma of the organs adjacent to the rectum. Most of these cases involved only a small segment, usually 6 to 8 cm. of the bowel, and usually only the anterior wall of the rectum was affected. In no case did the process extend beyond 18 cm. from the dentate margin. These cases were evidenced by the retractable ulcers, strictures or telangiectasis of the mucosa. In fact, the telangiectasis for a short distance was the tell-tale of the diagnosis.

The case which I wish to report is the most extensive of any that I have seen or, as far as I can discern, of any that has been described in the literature.

My idea in presenting this case before the conclusion of the treatment is to call to the attention of the medical profession the dangers, since the advent of the more powerful X-ray machines, of giving massive doses of roentgen-ray treatment, and also to bring forth a discussion on the treatment to be pursued. It is not my intention in any way to discourage the continuance of this method as the resulting factitial proctitis is usually a justifiable lesion. It has been estimated that only about 3 per cent of the cases treated for cancer of the adjacent organs to the rectum result in a factitial proctitis. Usually about six months elapses between the conclusion of the treatment and the evidence of factitial proctitis. Buie states that the shortest interval was only one week and the longest was six years; the average was about five months. The dosage as given by Drs. Buie and Malmgren was in terms of radium only—the smallest dose was 800 mg. hours and the largest 15,000 mg. hours.

There has been very little written about the care of severe cases of factitial proctitis and the treatment, as outlined in this case, may not be adequate enough to ride this patient over the stormy period which lies ahead of her.

On November 26, 1937, a young woman, 38 years of age, consulted me because of severe bleeding from the rectum. She stated that she had had considerable X-ray and radium treatment because of a cancer of the cervix and that the last treatment had been given her about six months before. Therefore, in this particular case, six months had elapsed between the last treatment and the first symptom of rectal disturbance. This patient stated she had frequent spells of severe bleeding from the rectum and as a result developed a progressive secondary anemia. On November 26, 1937, the sigmoidoscopic examination revealed a marked telangiectasis of the mucosa of the entire bowel as far as examined, or for a distance of 28 cm. from the anal verge. The entire bowel was covered with dried and fresh blood. Merely touching the mucosa with a cotton swab was sufficient to produce bleeding. There were no ulcers present and no growths visible. The rectal wall adjacent to the vagina was freely movable and felt relatively normal.

A diagnosis of factitial proctitis was made and the patient sent home with reassurances and advised to use cleansing enemas and witch hazel installations after each bowel movement. A prescription for iron compound was given to her. She was, however, warned to return if the bleeding should be profuse or prolonged. On January 5, 1938, she returned and stated that she had continued to bleed but not in any great amount. Hemoglobin at this time was 65 per cent by the Dare method. On January 17th and 18th she had profuse hemorrhages and her hemoglobin dropped to 48 per cent. The patient refused

to have a transfusion at this time and so a course of snake venom solution (moccasin) was then instituted because of its supposed effect on the capillaries rendering them less permeable to the blood. The snake venom solution was administered daily using 0.2 cc. for the first injection and gradually increasing 0.2 cc. a dose until 1 cc. was reached. She was also placed on liver and iron and large doses of vitamin C (225 mgms. daily). In a few days the bleeding stopped, and after continuing the treatment for ten days, I gave her a rest period from the snake venom as her hemoglobin had increased and her general condition had improved to such an extent that she felt almost normal. In three days she started to have severe bleeding again and when she reported back for treatment her hemoglobin reading was 40 per cent. The same procedure was again carried out with excellent results and again on a rest period she began to hemorrhage. This time her hemoglobin had dropped to 30 per cent. A transfusion was given and snake venom again administered along with the application of mild astringents to the lower bowel and a strict low residue high vitamin diet. She has now gone two weeks without any bleeding to speak of and her general condition has very much improved. The question is how much longer she will continue to have these alarming symptoms and will the snake venom continue to stop profuse bleeding, as it apparently has in this case? What other procedure should be carried out if the present treatment fails? It is now four and a half months since I first saw her and about three months since snake venom was first given.

It has been previously mentioned that the act of touching the bowel mucosa with a wisp of cotton was sufficient to produce bleeding; consequently, if the bleeding continues, a colostomy or cecostomy should be considered, as by preventing the fecal material from passing through the sensitive bowel we may stop a good deal of the bleeding which is her most dangerous symptom. It is rather unpleasant, however, to have an artificial anus so every possible form of medical treatment should be tried first, provided it can be safely prolonged until the dangerous bleeding has ceased.

Dr. C. O. Hanson will now discuss the roentgen ray and radium treatment used in this particular case.

Dr. CYRUS HANSON (by invitation): The first patient is of special interest because we treated her. She was a very interesting case of carcinoma of the cervix, a woman 38 years old, seen for a small amount of bleeding in what was apparently a cystic cervix. The physician in charge was going to amputate and repair the cervix and found a nodule under the mucosa in the muscular substance of the cervix which proved to be carcinoma. He stopped when he found it and inserted radium. She had, I believe, two insertions of radium, a total of 3,000 mgm. hours. Following this we gave her a series of 26 X-ray treatments in November, 1936, approximately 250 r. per treatment directed through various pelvic portals. She got along well until in February of the next year when following a little bleeding, a little lip of suspicious-looking tissue was biopsied and found to be positive for carcinoma. We instituted a second series of X-ray treatments and gave her a little heavier dosage than at the first series. These were all given with the 400 K.V. therapy. The dose, of course, was a massive dose but the first dose was inadequate to control the carcinoma as manifested by the recurrence later on.

The danger of irradiating the bowel has been recognized for a long period of time. The roentgenologists have always recognized the skin as one of the limiting factors of treatment and by the use of multiple portals we avoid that to a large extent; but as far back as 1923 Whipple and Warren recognized the fact that the mucosa of the bowel is a very sensitive structure to irradiation. They did work on a series of dogs and by irradiating the small bowel were able to slough out the entire lining with not a tremendous dose. We used to get the same complication with 200 K.V. therapy and I saw several patients at the University that had this type of lesion but not as severe as this woman has developed.

It is, as Dr. Christianson brought out, not a common complication fortunately. He says 3 per cent which I think is a liberal figure, although the proctologists see more than we do. Is it something that I do not know how we can prevent. I do

not know how we can tell which patient is going to get it. This particular woman, I believe, has complete healing on her skin with no evidence of telangiectasis and scarcely any pigmentation in the skin under the portals through which this dosage was delivered.

The lesion in the rectum is somewhat comparable to the atrophy and telangiectasis that we see on the skin following long continued or heavy doses of radiation. The mucosa becomes atrophied as the skin becomes atrophied and telangiectasis is somewhat comparable to the lesion we see in the skin. I have no suggestion for treatment of the condition when it arises. As a preventative, the surgeon or gynecologist should make especial effort to pack the rectum as far away from radium applicators as possible when this agent is used.

I have been interested in seeing the effect of snake venom in this case and it has certainly seemed to control the symptoms to a large extent.

Dr. CARL LAYMON: Dr. Hanson brought out the fact that there seems to be quite a bit of analogy between radioproctitis and radiodermatitis. In recent years, aloe vera has been used with some success in radiodermatitis; hence, it might be worthy of trial in factitial proctitis.

It seems to me that factitial proctitis represents an acute reaction on the rectal mucosa following irradiation and that the scarring is a later phase of the same process. The same course of events is seen in radiodermatitis.

FULGURATION OF CARCINOMA OF THE RECTUM

HARRY W. CHRISTIANSON, M.D., F.A.C.S.
MINNEAPOLIS, MINNESOTA

Introducing to the medical profession the fulguration method for treating carcinoma of the rectum is fraught with many dangers and is, therefore, a hazardous procedure. Unscrupulous and untrained surgeons may grasp at this method of treating all forms of carcinoma of the rectum because they may think it is a simple treatment which they can carry out and thereby obviate the necessity of referring the patient to a properly trained proctologist or surgeon.

My purpose in presenting this subject is to try to justify this procedure in certain selected cases and to condemn its use in other cases and also to lay down certain rules which seem paramount to me in the successful handling of these cases.

It is of the utmost importance to select only those cases for fulguration in which the cancerous growth is freely movable and is located on the posterior bowel wall below the peritoneal reflection. Such cases offer the greatest percentage of cures. Unfortunately these conditions are fulfilled in only about 5 to 10 per cent of the rectal carcinomas. (Buié estimates about 16 per cent of rectal carcinomas are on the posterior bowel wall.)

If the growth is on the anterior or lateral surfaces, there is danger of burning through the bowel wall and into other important structures such as the bladder or ureters; and if it is above the peritoneal reflection, there is the danger of burning through the wall of the bowel and producing peritonitis. If the carcinoma of the rectum has spread beyond the local immediate lymphatic glands, at least 85 per cent of the patients are dead within five years after the most radical surgery has been performed by competent surgeons. Should it be confined to its local growth, the reverse of this is true.

By carefully selecting the cases, it must become evident that it is possible to completely burn out the cancerous lesion and its immediate lymphatic structures as completely as if radical surgery were carried out. There are no structures posteriorly and below the peritoneal reflection that one necessarily must be careful about. It is not necessary to do a colostomy first in these particular cases and this is one of the strong points in favor of fulguration, especially in the old and infirm, as a colostomy is an unwelcome guest in any home. If a patient has a colostomy and the growth proves to be so fixed that it cannot be removed, fulguration and the insertion of radium may be resorted to with the hope that it will be of some value.

Fulguration and the application of radium may be done in cases where surgery is absolutely contraindicated or when a patient refuses surgery. It must always be remembered that if

fulguration is attempted in cases which do not fall into the preferred class, as previously outlined, one can only expect palliation. However, cures have been reported where only palliation was expected.

About four years ago, I found a carcinoma in a woman, 73 years of age. The mass was fixed in the middle rectum on the posterior wall. It was fulgurated several times and for the past three years there has been no recurrence of the growth. This patient had hypertension, obesity and diabetes and the surgeon referred her to me for palliative treatment. Of course, only three years have elapsed but this patient is 77 years old now and has no sign of malignancy, at present; she should live her life expectancy and in greater comfort than if she had had a colostomy.

Another case was that of a young woman of 30 who had a carcinoma grade three in the lower rectum on the right posterior wall. This was fulgurated several times and radium applied each time. About six months after the last fulguration, a small nodule could be felt under the rectal mucosa. The surgeon was confident that this was an extension of the growth and decided to do a posterior resection. Minute microscopic examination of the specimen removed, failed to reveal a single carcinomatous cell. The area in question proved to be an inflammatory gland. This patient is still free from any signs of carcinoma and is enjoying good health after 4½ years since the first treatment.

To date I have a series of about 20 cases on which it is too early to report any definite data. Suffice to say that I have fulgurated a number of cases for palliation only, and in this group I have had two deaths from metastatic carcinoma but both of these died without obstruction and without the need of a colostomy.

Radium is always applied at the conclusion of the fulguration, mainly, to prevent hemorrhage and secondarily, to destroy the cancerous cells.

The after-treatment of these cases consists mostly of rest and close attention to the bowels. No routine irrigations should be given. The patient is checked every month until the area appears free from carcinoma for a period of six months when the interval is lengthened.

In conclusion, I want to warn against the indiscriminate use of fulguration in the treatment of carcinoma and to remind you that it is not a new panacea for carcinoma. I am convinced, however, that in certain selected cases this method can be made a part of our armamentarium in our fight against cancer but we should always remember that complete eradication of the growth is absolutely essential for a cure. By keeping this in mind, we will advise the method which will accomplish this end to the best interest of the patient.

Discussion

Dr. J. K. ANDERSON: I have two cases very similar to those that Dr. Christianson has mentioned which I wish to incorporate in the records. This picture, as X-ray therapy is becoming more popular in the treatment of pelvic malignancy in women, we are probably going to see more of as time goes on. It brings up the question as to whether we realize or know what the physical effects of this powerful agent may be in time to come.

These two cases both have the very definite picture which Dr. Christianson described and which has been described by Dr. Buié: superficial ulceration in the bowel, telangiectasis, and throwing down of a great deal of scar to a point where the bowel may be cut down about one-half of its size. These cases both had large amounts of radiation, both X-ray and radium, for carcinoma of the cervix, and both of these women have a very markedly constricted area right at that level, with telangiectasis and superficial ulceration, a scar which bleeds profusely at times. I do not know whether this scar tissue formation is going to continue and block the lumen or whether it is going to remain as it now is. One case was radiated in 1936 and she still has a very marked narrowing. The other one was radiated in May, 1937, and she is blocked to the point where you can get only a 1 cm. proctoscope through the constricted area; hence, in addition to the telangiectasis and superficial ulceration you may get a throwing down of a lot of scar which may obstruct the bowel.

In reference to using snake venom for the purpose of controlling this hemorrhage, I have not used it for that purpose but I have used it in quite a number of cases in chronic ulcerative colitis where the bleeding was marked. There was apparently miraculous results in some cases.

Relative to Dr. Christianson's remarks in reference to fulguration, he has covered that subject. We do it in certain selected cases. The ones we have chosen have been older people, inoperable, in whom colostomies would have been a marked handicap, not only to them but to the people who were taking care of them. We simply burned a hole in the growth to allow them to have passage in the natural way, and destroyed the growth. I have not seen a case where the growth did not recur after being completely destroyed. The cases we have fulgurated have come back and the exodus has been very rapid after the thing has started again. This method of treatment has a field and should be used in selective cases, on the posterior wall, below the peritoneal reflexion and it should be kept in mind, as many of these people will refuse colostomies, if you can give them relief by "burning out a hole" in the lumen and so keep them from dying an obstructive type of death, it is worth while.

Case Reports

Mrs. R. H. D., age 48, was seen March 3, 1938. She had an intensive course of radium and X-ray in 1936, for carcinoma of the cervix, receiving the last treatment in October of that year. In January, 1938, she had an attack of abdominal pain and diarrhea which lasted about three weeks, and following this episode she noted bright and clotted blood with the stools, which has continued since then at frequent intervals.

Examination: There are some small and internal hemorrhoids of no moment. On proctoscopic examination 6 to 7 inches inside the anus there is a marked narrowing of the bowel lumen which will not admit the 1 cm. proctoscope, but can be dilated upon inflation so that the lumen above this narrowed area can be seen. Just distal to the narrowed area there is a fine ulceration in the mucosa which also extends into the narrow portion. This narrow portion appears to be made up of scar and does not resemble a new growth or one in the lumen of the bowel. This scarring and induration is more marked on the anterior surface but extends to some extent about the circumference. I felt that this narrowing, induration and telangiectasis was due to the radiation. Smooth diet, etc., were prescribed.

Mrs. G. N. P., age 56, was seen Nov. 17, 1937. She had had radium and X-ray in May, 1937, for carcinoma of the cervix. Following these treatments she had a diarrhea and some bleeding which gradually disappeared. About five or six weeks ago she again noted blood and on several occasions passed quite a little, (termed a hemorrhage by the patient).

Examination: There are some small skin tags and no internal hemorrhoids of no consequence. At 6 to 8 inches there is definite narrowing of the lumen with many superficial bleeding areas. Unable to get in farther. The narrowed area is quite hard and appears as though something is pressing on the rectum from the outside. I felt that was narrowing telangiectasis and ulceration was due to radiation. The X-ray (barium enema) in this case shows a hyper-irritability of the sigmoid loop which could be the residual from recent radiation therapy.

The picture seen in the bowel is the result of radiation of tumors outside the bowel. Etiologic factors are not simple. Pathological changes are in one or more walls of the rectum, usually anterior in the region of the second valve, opposite the cervix and uterus. The lesion varies from a mild inflammation of the mucosa to ulceration. The incidence is about .32 per cent. The average interval between the last radiation and appearance of symptoms in 48 cases was about four months. The shortest time was one week and the longest six years. The average interval between the last treatment and the changes seen in the bowel was one year, the shortest time three weeks. Rectal pain was the most commonly complained-of symptom, urge to go to the toilet, sensation of discomfort and heaviness. The diagnosis is by proctoscopic examination. There is an induration and deformity of the tissues surrounding. The characteristic finding is telangiectasis; there may or may not be ulceration. The inflammation and ulceration have a tendency

to heal. The treatment—soft stools, removal of irritants, cleansing of bowel after defecation.

Dr. CHRISTIANSON: In closing I wish to thank Drs. Anderson, Hansen and Laymon for their discussions.

I have not tried aloe vera in the treatment of factitial proctitis, but its use might be considered if it has been of value in the treatment of radio dermatitis. However, we must remember that we are dealing with a mucous membrane whose structure and environment is different than that of the skin and hence the reaction to the drug may not be the same.

I should like to give a further report on this case of factitial proctitis at a later date.

METHODS AND INDICATIONS IN THE SURGICAL TREATMENT OF FRESH FRACTURE OF THE NECK OF THE FEMUR

EDWARD T. EVANS, M.D.

MINNEAPOLIS, MINNESOTA

(Abstract of the paper delivered before the Minneapolis Clinical Club.)

The author presented his experiences covering Whitman's treatment of fractured neck of the femur and the newer surgical treatment by internal fixation. A choice of case was analyzed and the various fixative materials were described. The analysis of the closed and open methods of internal fixation was made and a detailed report of the author's own experience in the two methods was given, with the conclusion that closed method allows insurmountable difficulties in enough instances to have convinced the author that the open method should be the treatment of choice in the proper hands. The results of sixteen open reductions were given.

Discussion

Dr. WILLARD WHITE: I enjoyed the paper very much and I think Dr. Evans is to be congratulated on the excellent results he has obtained. I have seen him do a few of these and he certainly does them very nicely. He says, and I want to emphasize, that one of the most important things is to be absolutely sure you have as near a perfect reduction as can be obtained before the nail is put in, because you cannot expect the nail to cause a union if the fractured surfaces are not together in the first place.

Personally, I like to use the open method in old cases where it is advisable to freshen the fractured surfaces and where it is desirable to examine and be sure about the vitality of the head. I do not like to use guide wires as are usually used in the closed method, because of the inherent danger of the wire being driven on in through the acetabulum or becoming fishhooked, or broken. I like to use the method that was published by Smith-Peterson as his latest technique in a February number of Surg. Gynec. & Obst., 1937, in which the nail is driven in directly through a so-called closed method without the preliminary use of guide wires. Briefly, the technique consisted of identifying the head of the femur and this can be done by palpating where the femoral artery goes underneath Poupart's ligament and that spot does mark the center of the head. It is easy to take a skin clip and attach it in the skin directly over the head of the femur which gives you something to aim at. After you have accomplished reduction, holding the leg in internal rotation, get A-P and lateral films to be sure you have a reduction and if you find that the skin clip is a little higher or lower than you would like to have it, you can allow for them. The nail is then driven in through the neck and almost all the way into the head. A-P and lateral films are again taken and if the position is satisfactory, as it usually is, the nail can be driven on in and the whole procedure takes a very short time. Your chances of getting an accurate position of the nail are very good.

It may be true that opening the joint does not increase your risk when done by a good surgeon in a good hospital with good team-work, but I believe that in many instances the risk is increased because these factors do not obtain.

Dr. EDWARD T. EVANS: There are one or two things which I did not put in the paper because I think we are talking on principle. Sometimes experience will teach you how your principles may be thrown to the winds or that they can mean some-

thing. Both Dr. Cole and I have done something over thirty of these cases by the open method and we have done something over fifty by the closed method, not counting those I have had the opportunity to see by the good will of our friends in the Twin Cities. We know that errors happen in the closed method. We know that when an error happens you have got to spend a lot of time at the patient's expense and your own patience's expense. I have seen two cases in which the surgeon finally gave up in disgust and put a wire in what he thought was a reasonably satisfactory position. I did that myself once and rotated the head.

About 30 to 40 per cent of these have soft tissue between the fragments. It is true that Gaensela claimed from experiments that capsule between the fragments does not prevent union. Dog experiments and human patients between the ages of 50 and 60 are hardly comparable. With interposed tissue, I would know I haven't a perfect reduction and the main factor that assures of possible union is to have perfect reduction. The second thing is that even with the nail put in very carefully and directly in the center of the neck, when the nail is driven

home the head often rotates ahead and therefore you have separated your fragments. The third thing is that about 20 per cent of our fractures are oblique fractures and you know if you drive one of these large Smith-Peterson nails home in an oblique fracture, one flange of the nail will strike the proximal fragment a little sooner than the other portion of the fragment and will push it off and separate it. I have had two such cases in which I had to use extreme force to hold down the proximal fragments while I rapidly drove the nail home. Since Dr. Cole made this instrument which holds the fragments in place, we have been able to confidently nail our hips. Another advantage is visually manipulating the hip during the driving home to stabilize the head as much as possible while the nail is being driven into it.

These factors alone, if nothing else, have convinced me I am going to continue with the open reduction unless our armamentarium in this country is improved and equals the armamentarium in Sweden.

L. R. BOIES, M.D.,
Secretary.

Minnesota State Board of Medical Examiners

Julian F. DuBois, M.D., Secretary
St. Paul, Minnesota

DOCKET OF CASES

Cokato Chiropractor Pleads Guilty to Practicing Without a License

Re: STATE OF MINNESOTA vs. HAROLD A. KIRSCH

On May 2, 1938, the above defendant, Harold A. Kirsch, 33 years of age, entered a plea of guilty to an information charging him with practicing healing without a basic science certificate. Kirsch pleaded guilty at Buffalo, Minnesota, before the Honorable Leonard Keyes, Judge of the District Court for Wright County. After hearing the facts, Judge Keyes sentenced the defendant to pay a fine of \$200.00 or serve 60 days in the Minneapolis Work House. The defendant is suffering from multiple sclerosis, and the Court, upon being advised of all the facts, suspended the sentence and placed the defendant on probation upon the condition that he refrain from practicing healing in any manner.

Kirsch, who stated that he was raised at St. Cloud, opened an office at Cokato, Minnesota, in the fall of 1937. He represented himself to the public as a chiropractor and an X-ray technician. He claims to be licensed to practice chiropractic in the State of Iowa, and that he formerly maintained an office at Mason City, Iowa. Following an investigation conducted by the Minnesota State Board of Medical Examiners, a complaint was filed against the defendant on February 1, 1938. Following his arrest Kirsch closed his office. The office has since been reopened by a licensed chiropractor. The defendant undoubtedly deserves considerable sympathy because of his physical condition; nevertheless, he was previously advised that he could not practice in Minnesota without a license, and consequently, when he opened up his office, the Board had no other alternative than to proceed with the case.

Quack Doctor Forfeits Bail Bond of \$750 at Owatonna

Re: STATE OF MINNESOTA vs. J. A. WHITE

On Wednesday, August 3, 1938, Judge F. A. Alexander of the Municipal Court at Owatonna ordered the bail bond of J. A. White forfeited because of White's failure to appear in court for a preliminary hearing following White's arrest for practicing healing without a basic science certificate. The defendant had posted the bond, signed by Ralph Brown and August Briese of Owatonna, on July 26th. Mr. Brown is a local agent for the Metropolitan Life Insurance Company and Mr. Briese is a farmer. The Court's order means that the bondsmen will have to pay Steele County \$750.

White was arrested July 24th at Ladysmith, Wisconsin, following a joint investigation of his activities by Mr. Brist for the Minnesota State Board of Medical Examiners, Sheriff E. T. Helgeson of Steele county, and Mr. A. B. Anderson and Mr. Charles Stone, county attorney and assistant county attorney, respectively, of Steele county. White waived extradition and was returned to Owatonna where he was released on the bond furnished by Mr. Brown and Mr. Briese.

White came to Steele county in the latter part of March, this year, driving a Packard car with Georgia license plates. Because of a bad snowstorm White asked for shelter at the home of farmers a few miles west of Owatonna. He represented himself as "Professor" White and also as "Dr." White; he claimed to be a psycho-analyst and in a few days was diagnosing ailments and suggesting pills, tablets, capsules, etc. He charged from \$6.00 to \$40.00 per patient. The medicine was purchased by White at drug stores in Owatonna for a mere fraction of the amount he charged.

Sheriff Helgeson sent White's fingerprints to the Federal Bureau of Investigation at Washington and was promptly advised that White was wanted at Jesup, Georgia, for swindling and practicing medicine without a license. White, in the meantime had secured his release at Owatonna on bond and started for parts unknown. White also had been arrested in Detroit, Michigan, in 1918, on a charge of "larceny by trick." White claims to have been born in 1858 but appears to be 60-65 years of age; he is accompanied by Mrs. White. Judge Alexander issued a bench warrant for White's arrest and it is hoped that he will be apprehended somewhere.

The Medical Board wishes to specifically mention the splendid work done by Sheriff Helgeson and Mr. Anderson and his assistant, Mr. Stone; quackery cannot exist in a county where public officials give the whole-hearted coöperation and timely effort that was given in this case.

News Items

The Montana board of medical examiners last month granted 20 physicians licenses to practice medicine in the state; all of these men had previously been admitted to practice in other states. They are: W. A. Beasley, Galen; J. C. Bunten, Cheyenne, Wyo.; Fred R. Erenfeld, Minot, N. D.; Edward W. Gans, Harlowton; Harry V. Gibson, Eau Claire, Wis.; Edward A. Hagmann, Billings; Fritz W. Hurd, Billings; Lucien W. Ide, St. Paul, Minn.; Robert G. Lemon, Rochester, Minn.; Duncan S. MacKenzie, Havre; Domingo N. Monserrate, Helena; James D. Morrison, Denver; Virgil O. Parrett, Beach N. D.; Donald F. Rodawig, Spirit Lake, Iowa; Louis M. Rosenblatt, St. Paul, Minn.; Thomas W. Saam, Butte; Roland A. Schaumlöffel, San Fernando, Cal.; Kenneth A. Tyler, Boulder; Robert E. Walker, Livingston; and Stanley J. Walters, Glendale, Cal.

Dr. Albert Fritsche of New Ulm was elected president of the Southern Minnesota Medical association at the annual convention held in Rochester, Minnesota, recently. Other officers are: Dr. J. W. Gamble, Albert Lea, first vice-president; Dr. R. F. Mitchell, Grand Meadow, second vice-president.

Dr. J. C. Litzenberg, retired head of the department of obstetrics and gynecology, University of Minnesota, was named president-elect of the Central Association of Obstetricians and Gynecologists at the organization's annual meeting held last month in Minneapolis. Dr. Ralph A. Reise of Chicago assumed the presidency of the association, having been chosen president-elect a year ago. Other officers elected were: Dr. William Sellers, New Orleans, vice-president; Dr. William A. Mengert, Iowa City, secretary-treasurer; Dr. Harry J. Davis, Topeka, assistant secretary; and Dr. John Moore, Grand Forks, and Dr. G. T. Gustafson, Indianapolis, executive committee members.

Dr. F. L. Jennings, assistant superintendent and medical director at Glen Lake sanatorium for the last 21 years has been named superintendent of Sunnyside sanatorium, Indianapolis. Dr. Jennings has been a clinical assistant and professor of medicine on the staff of the University of Minnesota school of medicine since 1922 and for the past 10 years has been a member of the board of directors of the Hennepin County Tuberculosis association.

Dr. Robert G. Lemon, of the surgical staff of the Mayo Clinic, Rochester, Minnesota, has accepted a position in the Northern Pacific Beneficial Association hospital, Glendive, Montana.

Dr. Russell Nelson, Minot, North Dakota, has been appointed assistant resident physician at Johns Hopkins hospital, Baltimore, Maryland, and assistant instructor in medicine at Johns Hopkins University. He is specializing in internal medicine.

Dr. Willis Shepard, formerly of Linton, North Dakota, has gone to Eugene, Oregon, to practice medicine.

Construction of a new thirty-one-bed hospital in Lake City, Minnesota, will be begun shortly. A federal grant of \$36,500 was allowed September 26 after a favorable vote of the citizens on a special bond issue of \$44,500. The new hospital to be known as the Lake City Community Hospital, will replace the seventeen-bed institution now lodged in a fifty-year-old residence. Staff members are Drs. W. J. Cochrane and H. E. Bowers of Lake City.

Dr. W. E. Richardson, formerly of Phillip, South Dakota, is now practicing in Rushford, Minnesota.

Fifty years of medical practice completed by Drs. Charles M. Keeling of Springfield, and Thomas Cruickshank of Vermillion, entitled the two members of the eighth district of the South Dakota Medical society to certificates of honorary memberships in the association. The awards were made at the fall meeting recently held in Yankton, South Dakota.

Dr. T. D. Jones, Bowdle, South Dakota, is now studying in the New York Polyclinic School and Hospital, New York City. He is taking postgraduate work in Proctology, Urology and Dermatology, and expects to be gone about six months. During his absence, Dr. Stephan Manong of New York City will take charge of his practice.

Dr. R. H. Leavitt, who practiced in Carson, North Dakota until he moved to Glendale, California, in 1935, has returned to re-establish his practice in the Carson territory. Dr. L. B. Moyer who succeeded Dr. Leavitt, is leaving to practice at Wimbledon.

Dr. A. Stolinsky, Lisbon, North Dakota, took part in the special seminar on Physical Therapy held recently in Chicago.

Dr. L. F. Hawkinson, who has been associated with the Brainerd Clinic at Brainerd, Minnesota, for the past thirteen years, will leave November 15th for Oakland, California, where he will establish practice.

Dr. Gustave Schulze of St. Paul has been appointed to the Minnesota State Board of Health. The appointment was made by Governor Benson last month. Dr. Schulze, whose term will expire in 1941, succeeds Dr. N. G. Mortensen of St. Paul who resigned.

The University of Minnesota Center for Continuation Study announces a postgraduate medical course in Tuberculosis, November 14 to 19, 1938. Both pulmonary and extrapulmonary forms of tuberculosis will be discussed. Lectures will be given at the Center for Continuation Study with clinical aspects observed at Glen Lake Sanatorium. Among others on the faculty for the course will be Dr. J. A. Myers, Minneapolis; Dr. E. S. Mariette, Glen Lake; Dr. H. H. Hilleboe, St. Paul; Dr. W. S. Lemon and Dr. H. Buchstein of Rochester, Minnesota. Tuition for the course is \$25.00. Registration may be made by sending in a registration fee of \$3.00 which will apply on the tuition. Physicians and their families are invited to stay at the Center for Continuation Study.

Dr. E. M. Porter, Great Falls, Montana, was elected president of the Montana Public Health association at the annual meeting held last month. Dr. Porter, who is president of the state board of health has been a member of that board for the past 20 years. Dr. W. F. Cogswell, secretary of the state board of health was named association secretary for the 25th successive year.

The South Dakota State Medical Association has arranged postgraduate courses in obstetrics, pediatrics and syphilis for physicians through the coöperation of the Medical School of the University of South Dakota and the State Board of Health. The first course was presented October 31 in Aberdeen; the second in Sioux Falls. On November 2, there will be a course given at Huron and on November 3 one at Rapid City. Local chairmen are: Dr. J. E. Bruner, Aberdeen; Dr. W. E. Donahoe, Sioux Falls; Dr. J. C. Shirley, Huron; Dr. R. E. Jernstrom, Rapid City.

Necrology

Dr. Andrew Hyden, 75, a resident of Alcester, South Dakota, since 1895, died at his home August 21, 1938. He was graduated from Keokuk (Iowa) Medical College in 1894 and after practicing a year at Erwin, South Dakota, came to Alcester.

Dr. Henry Martyn Bracken, 84, one time dean of the University of Minnesota medical school and executive officer of the Minnesota state board of health, died recently at his home in Claremont, California. He came to Minneapolis in 1885 after working in Venezuela, West Indies, the Isthmus of Panama and virtually all Atlantic ports of Mexico, Central America and South America. In 1887 he was appointed professor of materia medica and therapeutics at the University of Minnesota and later was acting dean. He was appointed a member of the state board of health in 1895 and was elected secretary and executive officer in 1897. Upon retirement as state health officer September 1, 1919, Dr. Bracken was commissioned in the reserve corps of the U. S. Public Health service as surgeon and assigned to the Veterans' bureau. In 1923 he resigned and moved to California.

Dr. Martin C. Bergheim, Hawley, Minnesota, died October 4, 1938, at Moorhead, Minnesota. Dr. Bergheim was graduated from the University of Minnesota medical school in 1919 and after a residency in Detroit, Michigan and a year of practice at Raymond, Minnesota, he came to Hawley in 1921 where he remained since that time.

Dr. Edward Donovan, 80, pioneer physician of Langdon, North Dakota, died in Arthur, North Dakota, October 6, 1938.

Dr. John Folta, 37, Ceylon, Minnesota, died October 14, 1938. He had practiced at Ceylon for eight years.

ALBERT HENRY PARKS, M.D.

1880-1938

Dr. Albert Henry Parks was born in Battle Creek, Michigan, April 15, 1880, and died in Minneapolis, Minnesota, August 30, 1938. He received his Bachelor of Arts degree from the University of Michigan in 1904. In 1906, he was graduated from Northwestern University, receiving his Master's and M.D. degrees. He served his internship in St. Luke's Hospital, Chicago, Illinois, and was licensed to practice in Minnesota on April 12, 1907, and in California February 23, 1922.

Dr. Parks was assistant city physician from 1908 to 1915, during which time Hopewell Hospital for tubercular patients was opened. He was given charge of the medical treatment of these patients and acted as superintendent of the institution. He was a founder of the Lake Harriet Commercial Club and served as its first president. He was a founder and first Master of the Lake Harriet lodge A. F. & A. M. 277. In 1913 and 1914 he served as alderman of the 13th Ward, resigning in 1915 to give his attention to practice. In June 1917 he was appointed a member of the local draft board of the 13th Ward of Minneapolis. In June 1918 he resigned and on August 1 was commissioned captain in the Medical Section of the Officers' Reserve Corps, receiving his honorable discharge on April 15, 1919.

He was appointed chief of the Surgical Service, Division "B" of the General Hospital Staff, Minneapolis, January 14, 1918. Dr. Parks was appointed a member of the Board of Public Welfare during the year 1923. He was a member of the Staff of St. Barnabas Hospital for five years. He was a member of the Surgical Staff of Asbury Hospital from the beginning of his practice until his retirement. He served as Chief of Staff during the year 1932. The last years of his surgical practice were spent here, where he endeared himself to the hospital personnel and to the staff of doctors.

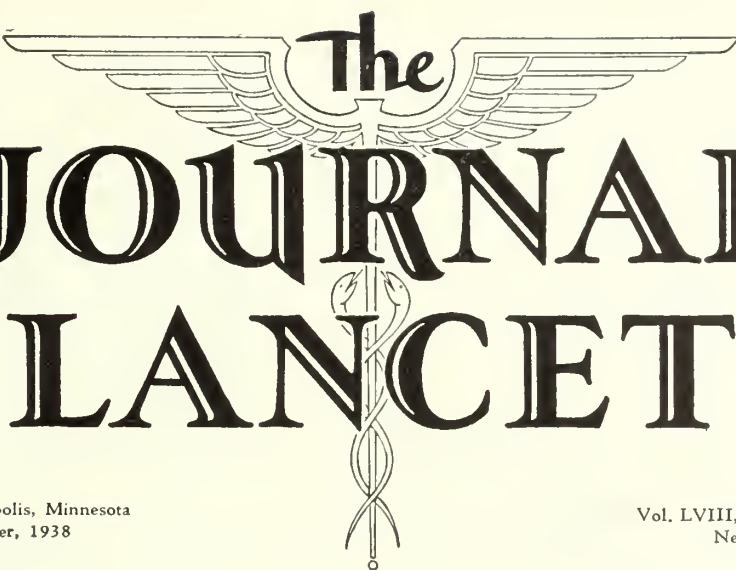
Dr. Parks used unusual foresight in preparing himself for his profession, obtaining his B.A., M.A., and M.D. degrees and serving his internship in one of the leading hospitals. When he began to practice in Minneapolis, he continued to re-educate himself by his association with the General Hospital. He carried out a program for the young physician that was ideal. In his private practice from the very beginning there was ample evidence that he was well prepared and that he was applying the highest ethical principles of medical practice.

Dr. Parks felt a civic duty which was shown by his willingness to serve the public hospitals, the public welfare board, and the city council.

Dr. Parks was generous in his praise and help to others but modest concerning himself. He will be remembered for his gracious manner, his thoughtfulness of others, and his pleasant companionship, as well as for his painstaking care of his patients and his scientific attainments. Dr. Parks was a colorful figure in his profession, a skillful surgeon, an astute diagnostician, and an ideal consultant. My association with him in surgery at Asbury Hospital during his last active years was an inspiration.

C. C. K.

The JOURNAL LANCET



Minneapolis, Minnesota
December, 1938

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New Series

Phytobezoar With Gastric Ulcer*

Report of a Case

N. O. Ramstad, M.D.†

Bismarck, North Dakota

EARLY medical writers were much interested in the finding of hard balls in the stomach and intestines of animals. These masses were known as bezoars, a word of Persian or Arabic origin, signifying antidote and referring to a mass in the stomach. If the mass consisted of food remnants it was called a phytobezoar, from the Greek word meaning plant. If it consisted largely of hair it was called a trichobezoar, from the Greek word for hair. These bezoars were eagerly sought after in earlier times and commanded high prices because remarkable healing qualities were ascribed to them. Upon examining the literature referring to phytobezoars, I found over sixty cases reported, mostly from the central and southern parts of the United States. The seed of the persimmon fruit is the most common source. This fruit resembles a large plum in appearance and contains numerous seeds. The fruit is also very rich in pectin and gums, which may be factors in the production of the bolus in the stomach.

The symptoms of phytobezoar resemble those of gastritis. Distress in the epigastrium, before and after meals, a feeling of gas and fullness, nausea, vomiting, or diarrhea are usually present. Blood may be present in the vomitus or in the feces. These symptoms are not changed by the ingestion of food, alkalies or medicines. Often a movable mass may be palpated in the epigastrium. The diagnosis may be confused with that of ulcer or cancer of the stomach, gallbladder disease,

tumors in the transverse colon, movable kidney or spleen, or other tumors in the upper abdomen. Most often the diagnosis is definitely made by the roentgenologist and the findings may be quite confusing unless the possibility of a bezoar is kept in mind.

TREATMENT

The medical treatment reported in a few cases has consisted of massage of the stomach area, the administration of large doses of hydrochloric acid and the use of laxatives. As this method of treatment seldom has been successful, the removal of the mass in the stomach by operation is indicated.

Recently we saw a patient with a phytobezoar who presented symptoms ten to fourteen days after eating persimmons.

CASE REPORT

History. On December 3, 1937, the patient, a woman aged 58, came to us giving the following history: In 1912 she had had an operation for acute appendicitis, and in 1925 had been operated on for gallstones, with a normal recovery in each instance. She had been well until about one month before when she developed a feeling of fullness and aching in the upper abdomen which was not influenced by food. There had been no vomiting of gastric contents or of blood. The bowels had been regular, the weight stationary, and the appetite fair. None of the usual symptoms of gastric ulcer was present.

* Read before the Sixth District Medical Society, Bismarck, North Dakota, April 5, 1938.

† Quain & Ramstad Clinic.

FIG. 1



FIG. 2

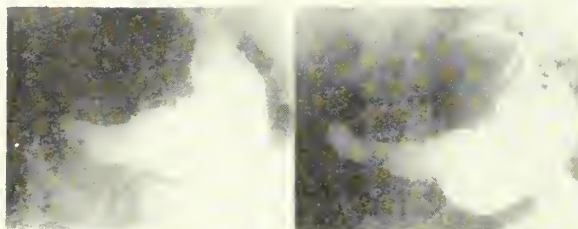


FIG. 3



Fig. 3. View made with patient upright. The phytobezoar floats on top of the barium meal. This is one of the points in the differential diagnosis between phytobezoar and a polyp. A polyp will not float in the barium meal.

FIG. 4

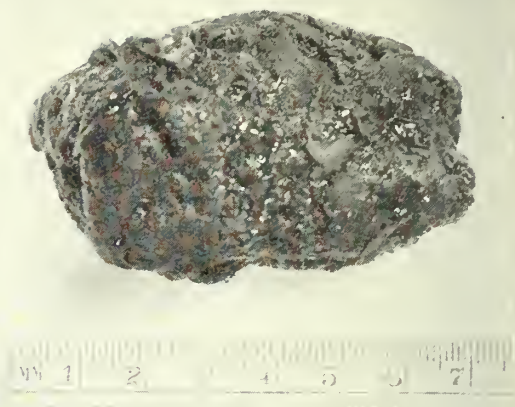


FIG. 5



Fig. 1. Four views of the stomach showing the phytobezoar in four different positions. Between each view the mass was displaced from the pylorus toward the cardiac end of the stomach. The upper left view shows it in the pyloric region, the upper right and lower left in the middle third of the stomach, and the lower right in the cardiac end of the stomach.

Fig. 2. Two views made in the prone position with the stomach full of barium. Note that the phytobezoar can be missed very easily on these views.

Fig. 4. View of the phytobezoar showing its roughened surface and approximate size.

Fig. 5. View of the phytobezoar sectioned to show its structure.

Physical Examination. The temperature, pulse, blood pressure, and urine were normal. There was no dental infection. The throat, thyroid, heart, lungs, and pelvic organs were normal. The abdominal examination disclosed two scars which were firm and well healed. There was distinct tenderness on palpating the epigastrium. An X-ray examination of the gastro-intestinal tract was made by the roentgenologist who reported that he found a movable mass in the stomach 4 x 6 cm. in size. Figures 1, 2 and 3. He obtained from the patient a history that she had visited in Kansas about six weeks before and that she had eaten some persimmons and swallowed a few of the seeds. His diagnosis was phytobezoar due to persimmon seeds with a remote possibility of gastric polyp. The surgical removal of the mass in the stomach was advised.

Treatment. The operation performed twenty days later disclosed a mass in the stomach which could be moved freely from the cardiac to the pyloric end. An opening was made transversely in the stomach and the mass examined. It was about the size and shape of an

egg, with a black roughened surface. An attempt to remove the mass with instruments was deemed inadvisable as there was danger of the mass breaking or crumbling, and of particles being left in the stomach. The incision was enlarged so that two fingers could be inserted, and the mass was removed completely. Figures 4 and 5. There was an ulcer three-fourths of an inch in diameter on the posterior wall of the stomach three inches from the pylorus. This seemed to involve only the mucous membrane. The ulcer was not resected as it was our belief that removal of the foreign object and medical treatment of the ulcer would effect a cure.

The patient made a normal recovery following the operation and was placed on the usual medical and dietetic treatment for ulcer. On March 2, 1938, she was examined at the clinic. She stated that she felt well and that she had had no recurrence of her gastric distress. X-ray examination of her stomach showed it to be normal and without evidence of ulcer or a recurrence of the mass.

Primary Carcinoma of the Lung*

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PULMONARY cancer can be traced back to the writings of Agricola in 1521 to 1527. Mathesius, in 1559, Pansa, in 1614, and Engelschall, in 1725, described cases which later were proved to be pulmonary malignancies. All of these were the Schneeberg mine cancers, and were not recognized by the authors as true pulmonary cancers. The priority of describing pulmonary carcinoma belongs to Morgagni, who, in 1761, presented a case in which necropsy revealed a cancerous ulcer of the lung. The second authentic pulmonary cancer was reported by Bayle in 1810. By 1878, the number of cases recorded in the literature, as reviewed by Reinhardt, had increased to 28. Since that time, the number gradually increased until at present the disease is no longer a rarity.

INCIDENCE

Both the actual number of pulmonary carcinomas reported and a constantly growing literature on the subject reflect an increased frequency of these neoplasms. However, more than these evidences are required to determine whether the increased incidence is real or apparent, absolute or relative. Many investigators claim that the alleged increased frequency is due to improved clinical acumen, increased interest in the disease and growth of the practice of postmortem examination. Those who believe that an actual increase in incidence

has occurred maintain that the percentage increase of carcinoma of the lung in all autopsies, and above all, a similar increase of pulmonary cancers in all cancers discovered at necropsy, prove irrefutably the reality of the increase.

In the United States, Rosahn's analysis of a large series of autopsies revealed a 20 per cent increase of all types of carcinoma, but an 81 per cent increase of pulmonary carcinomas. Wells has produced a table showing cancer of the lung equal in frequency with cancer of the breast. Jaffe found that only carcinoma of the stomach and intestine exceeded in frequency cancer of the lung.

In England, Davidson's monographic treatise confirms an absolute increase. Supporting this conclusion, Bonser of Leeds, Duguid of Manchester and Simpson of London also have shown an increase of pulmonary cancer both in total necropsies and in the total number of carcinomas. All these investigations, as well as others, indicate a definite, real increase in England.

In Germany, it was determined by Seyfarth in Leipzig that pulmonary carcinomas constituted 15.5 per cent of all cancers found at postmortem in 1924. Wahl, of Berlin, observed that while the number of cancers in all autopsies decreased, the percentage of cancers having origin in the lungs markedly increased. Practically all investigators in Germany have found the statistics over-

* Read before the Lymanhurst Medical Staff, Minneapolis, September 27, 1938.

whelmingly in favor of a real increase in the incidence of these neoplasms.

In Switzerland, Czechoslovakia, Austria, Hungary, Denmark, France, Russia and Argentina, data have been presented proving both an increase of pulmonary carcinomas in all necropsies and an increase in the percentage of all cancers found to be primary pulmonary cancers. One Russian observer found such a great increase of pulmonary cancer that he recommended the establishment of sanatoria for its treatment alone.

Summarizing, then, a preponderance of evidence from widely scattered countries shows an absolute increase in the incidence of these tumors. Such mitigating factors as improved clinical acumen, added diagnostic facilities and other similar influences affect not only pulmonary carcinoma but all diseases. Therefore, conclusive proof indicates that the increased frequency of pulmonary carcinoma is not only apparent but real.

ETIOLOGY

Why has the incidence increased so markedly during the span of the last generation? What habits of living, environmental conditions or industrial processes have changed so greatly during this period as to produce more cases? In answer to these questions, 14 different etiologic agents have been found in the literature.

Among the suggested causes, radium emanations and arsenic have been proved of importance in the Schneeberg mine cancers. Other occupational and industrial hazards have not been found to be notable etiologically. Influenza, tuberculosis and other chronic lung diseases have been found responsible for metaplastic changes in the bronchial epithelium. This metaplasia may terminate in cancerous proliferation. Consequently, Fried considers the chronic lung diseases a major factor in the increase of pulmonary carcinomas. Weller believes that heredity may have to be accorded a more prominent position in the etiology of these cancers than it has in the past. Trauma, general hygiene, roentgen rays, the inhalation of dust, tar particles, motor exhaust fumes, war gases and tobacco smoke may each be responsible for a very few of these neoplasms, yet proof that any one of them is etiologically significant is lacking.

Without exception all the 14 etiologic agents so far suggested have one common quality, the production of chronic pulmonary irritation. Chronic irritation, whether simple or complex, may be chemical, mechanical, bacterial, radioactive or thermal. Several of the causes or possible causes that have been discussed may be classified under two or more of these headings, but all of them fall under at least one. Since the suggested causes are so diverse, the only conclusion possible is that irritation, which is common to all of them, is the real etiologic agent in the disease.

PATHOLOGY

From 75 to 90 per cent of these neoplasms arise in the large bronchi two or three centimeters from the tracheal bifurcation. These are known as the hilar or central type. The rest arise from the terminal bronchioles, and are known as peripheral pulmonary cancers. Their size varies from small outgrowths of the bronchial

mucous membrane to tumors the size of a grape fruit or a man's head. Regarding their macroscopic features, the masses are found to be grey, white or pink on cross section. The larger tumors are soft and not unlike caseous tuberculous masses, sometimes with cavities filled with mucus, pus or necrotic material. Those containing many mucous glands are softer and more slimy than the others, as are also their metastases.

Within the past few years, the "oat-celled" tumors of the English have been definitely classified among bronchiogenic carcinomas. At present, opinion leans to the belief that some of the superior pulmonary sulcus tumors originate in the terminal bronchioles or lung tissue. Now, also, sufficient confirmation of the endothelial origin of endotheliomas of the pleura has appeared in the literature to warrant grouping many of them among pulmonary carcinomas. The significance of these findings is that even within comparatively recent years, three pathological entities, either in whole or in part, have been reclassified as pulmonary carcinomas.

Histogenically, also, much progress has been made in recent years. Bronchial epithelium is merely a continuation of the epithelium of the trachea. The stratified squamous epithelium of the trachea, however, soon gives way to ciliated columnar cells and these in the terminal bronchioles to cuboidal cells. The bronchial mucous glands are invaginations of bronchial epithelium lined with goblet cells. Both the columnar and goblet cells arise from the germinal layer of basal cells resting on the membrana propria. Previously, pulmonary carcinoma has been conceded to have three cellular origins, the bronchial epithelium, the bronchial mucous glands and alveolar epithelium. However, the present opinion is that all pulmonary carcinomas, irrespective of the predominant cell type, arise from the basal cells. Thus, then, a stratified squamous cell carcinoma, an adenocarcinoma or an undifferentiated cell carcinoma, the three cytologic types, arise from the common parent cell, the basal cell. Consequently, the previous triad of origin has been replaced by the unicellular concept of the present time.

CLINICAL CONSIDERATIONS

Sex Incidence—In the present study, embracing 5,121 microscopically proved cases, four males were found to have the disease for each female.

Age Incidence—The youngest case is that of a 16-months-old child reported by Beardsley. The oldest is a patient of 91 years reported by Frommel. Four-fifths, or 80 per cent, of 2,796 cases, were found to occur between the ages of 40 and 70.

Symptomatology—All of these neoplasms arise within a bronchus, and, therefore, obstruction to the flow of air into or out of the lung becomes the principal mechanism in the production of symptoms. Results of obstruction of a bronchus are atelectasis, bronchiectasis and abscess formation. Two other fundamentals in the genesis of symptoms should be mentioned. First, as with carcinoma elsewhere in the body, ulceration and hemorrhage are among the first phenomena of these tumors. Secondly, the bronchiogenic cancer simulates a foreign body which nature is trying to extrude, so cough, either with or

without sputum, is one of the most frequent manifestations. The symptomatology may even suggest the location of the carcinoma. Cough and hemoptysis result from ulceration of tumors of the larger bronchi. In the peripheral tumors, cough either is entirely absent or occurs late as a result of pressure on a large bronchus. Paterson has stated that the blood-cough complex is most characteristic of the central type, and pain is the early typical symptom of the peripheral type.

Frequency of symptoms in 1,456 cases so analyzed was as follows:

Symptom	No. Cases Analyzed	No. Cases with Symptom	Percentage Cases with Symptom
Cough	1376	996	72.3
Sputum	1217	822	67.5
Pain	1439	861	59.8
Dyspnea	1299	716	59.7
Emaciation	1187	573	48.2
Pyrexia	1112	477	42.8
Hemoptysis	1456	583	40.0

Other symptoms such as dilated veins, cyanosis, edema, night sweats, clinical secondary deposits, vomiting, dysphagia, hoarseness and clubbed fingers occurred with varying frequency in less than 20 per cent of the cases. Thus, it is seen that cough occurs in three out of four cases; expectoration, pain and dyspnea in three out of five; and hemoptysis and fever in two out of five cases. While emaciation occurs in almost 50 per cent of these patients, it is usually a late manifestation and should not be expected early.

One reason why these neoplasms are diagnosed only with difficulty is that they have no pathognomonic symptom complex. Nevertheless, certain symptoms or groups of symptoms should lead one to suspect the diagnosis. For instance, a history of repeated attacks of either pneumonia or bronchitis within a relatively short period should lead one to suspect pulmonary cancer, especially when they occur in an adult. Pain in the chest, which is persistent and not relieved by strapping should arouse suspicion. Next to pain, dyspnea is the most frequent complaint that directs the patient to a physician. One clinician has stated that hemoptysis is as indicative of carcinoma of the lung in an adult as of tuberculosis in a younger person. In any atypical pulmonary disease in an adult, especially if characterized by cough, pain, dyspnea or hemoptysis, pulmonary carcinoma should occupy a prominent place in the differential diagnosis.

Physical Signs—The most frequent early signs discovered by examination are those of bronchial stenosis or atelectasis. These are decreased mobility of the chest, dullness or flatness usually extending outward from the hilus, and suppressed breath sounds. One day breath sounds are heard accompanied by rales while the next day either or both will have disappeared. This variability itself is characteristic of the disease. On inspection, breathing is labored and chest movement lags or is absent. Unilateral decreased expansion is frequently seen. If the disease has advanced far, asymmetry of the

chest is present. Retraction of the interspaces occurs when the pleura is extensively involved. However, when effusion is present the intercostal spaces may bulge. In the late stages, the veins of the chest wall are distended, and edema of the face, neck, arms or hemithorax may be visible. Cachexia appears often and cyanosis occasionally.

Palpation confirms the decreased mobility of the chest wall. Tactile fremitus is usually decreased, and, at times, absent on the diseased side. It may be increased on the unaffected side. The cardiac impulse is usually displaced toward the pulmonary lesion. Tenderness of the intercostal spaces can often be elicited. Enlarged glands may be palpated between the heads of the sternocleidomastoid muscles.

Percussion notes, like auscultatory findings, change from time to time. Percussion usually produces a dull sound, and, if obstruction is complete, a flat note. Dullness is often found an inch or two to one side of the sternum with a normal area between the dull space and the clavicle. Staehelin has said that a circumscribed area of dullness with decreased breath sounds and decreased vocal fremitus indicates almost certainly the diagnosis of pulmonary cancer. Nowhere else in pulmonary diseases is found the hard stony resistance in percussion that is noted in pulmonary carcinoma.

In auscultation, the most characteristic finding is suppressed or absent breath sounds. In the hilar type, breath sounds may be absent over a whole lobe and the next day both breath sounds and rales may be heard. When a tumor closes or fills a bronchus, collapse of the portion of the lung supplied by the bronchus takes place. Then, breath sounds are absent and both vocal and tactile fremitus are either diminished or absent.

LABORATORY AND OTHER DIAGNOSTIC AIDS

Pleural Effusion occurs in from one-third to one-half of these cases. The fluid may be serous, purulent or bloody, and when it is the latter, of the three most frequent causes—tuberculosis, infarction and carcinoma—the last is by far the most likely. None of the other effusions is so prone to fill the entire chest as is a carcinomatous one. Malignant cells can be demonstrated with sufficient frequency to make an examination of the fluid advisable.

Sputum. In 1935, Dudgeon and Wrigley perfected a technic for the examination of sputum for cancer cells whereby they were able to demonstrate the histologic type of growth in 20 of 26 cases of proved pulmonary carcinoma. This marks an important advance in the early diagnosis of these tumors. Finding of tubercle bacilli in the sputum does not refute the diagnosis of pulmonary cancer.

The Blood Picture presents nothing helpful in a diagnostic way. The frequently found leucocytosis is a manifestation of secondary infection, and a low hemoglobin or red blood cell count indicates a hemorrhage or hemorrhagic effusion.

Roentgenology. In a recent editorial, Fishbein remarked that when one considers that the X-ray examination alone is capable of rendering a correct diagnosis

of pulmonary carcinoma in not less than two-thirds of all cases, early diagnosis should not be considered difficult.

Hilar or central pulmonary carcinomas have two roentgenologic characteristics in particular that are of diagnostic importance. The first, hilar density, is unilateral, is roughly triangular with the apex pointing outward, and from the borders strand-like processes radiate outward toward the lung periphery. This density usually lies opposite the space between the sixth and eighth ribs or at the level of the seventh rib posteriorly. The second characteristic, atelectasis, is described as a smooth, homogeneous density, anatomically limited, and carrying the normal lung markings. The appearance of bronchiectasis, a mottled, fan-shaped density at the costophrenic angle, also is suggestive of a bronchial tumor. In addition to these evidences, elevation of the diaphragm on the affected side, and displacement of the heart and mediastinum toward the pulmonary lesion are characteristic of atelectasis and, therefore, suggest bronchial carcinoma.

In the less frequent peripheral type, the typical findings in the X-ray plate are either a solitary, round shadow in the lung field, or a massive involvement of one or more lobes. The solitary, circular form is recognizable as a dense, round area usually without the sharply defined edge seen in the shadows of metastatic deposits. Such primary lesions are invariably single, which fact distinguishes them from metastatic growths. The massive lobar type appears as a complete consolidation of a whole lobe, less dense than fluid, without mottling of any kind nor with the varied texture seen in most cases of lobar pneumonia. The border or edge is an irregularly infiltrating one.

In fluoroscopy, Polevski has described the following triad of findings as pathognomonic of pulmonary cancer: (1) elevation of the diaphragm on the affected side, (2) paradoxical or "seesaw" movement of the diaphragm, and (3) pendulum movement of the heart toward the side of the lesion in inspiration and away from it in expiration.

Bronchography constitutes one of the most helpful aids to diagnosis. Bronchial occlusion or obstruction to the passage of lipiodol is characteristic of a bronchiogenic carcinoma.

Bronchoscopy. Conclusive proof of the diagnosis depends upon biopsy, which is best accomplished by bronchoscopy. Wheezing respiration, or the clinical and roentgenologic evidence of either atelectasis or emphysema are signs of bronchial obstruction which constitute the indications for bronchoscopy. Early diagnosis by bronchoscopy is possible in 75 per cent of these cases.

TREATMENT

Only three forms of treatment for pulmonary cancer are known: (1) palliation, (2) irradiation, and (3) surgical removal. Many authors consider irradiation as palliative; others maintain that it is potentially curative; still others regard surgery as the only possible means of cure.

Palliative Treatment may be directed to the patient's general well-being, to complications and sequelae, or to

specific symptoms. For general systemic stimulation, daily intravenous injections of 10 cc. of a 20 per cent solution of alcohol have an immediate stimulating effect without influencing the course of the disease. Graham advises cautery pneumonectomy for multiple pulmonary abscesses. He has found that repeated cauterization of the growth through a bronchoscope insures good drainage and relief of atelectasis.

Pain is usually due to pleural involvement and may be relieved by sand bags and strapping. Heroic doses of opiates are often required. Artificial pneumothorax, chordotomy, alcohol injection and section of the dorsal roots may be necessary for relief of pain. Dyspnea and cyanosis are caused by increased intrapleural pressure. Rest in bed often reduces this pressure, yet oxygen may be required. Aspiration of the effusion frequently provides temporary relief. The sitting position and lying on the diseased side may improve the dyspnea. Cough may be influenced only by large amounts of antispasmodic cough mixtures or opiates. The latter in seemingly excessive amounts may be required for insomnia.

Irradiation consists either of X-ray therapy or radon seed implantation into the growth through a bronchoscope or by thoracotomy. Many radiologists believe that both curative and palliative results make this type of therapy the most effective thus far used. Some writers contend that the radioresistant cells of pulmonary carcinoma militate against such treatment. The immediate palliative results of irradiation are usually followed by a more rapid downhill course which terminates in death. Nevertheless, Paterson feels that the more merciful type of death justifies the treatment even if life is not prolonged.

Surgical Treatment is divided into curative bronchoscopic procedures and actual surgical excision. Bronchoscopically, at least seven cures have resulted from excision, cauterization or radium implantation. These cases constitute an emphatic argument in favor of early bronchoscopy, for by early diagnosis more such possible cures may result. At present, the malignancy of many of the cases reported as cured by endobronchial methods is being questioned. Opinion prevails that the type of tumors to which such treatment is applicable composes a minority of pulmonary carcinomas. Therefore, it would seem that wide excision rather than bronchoscopic therapy would be the curative agent of choice. Surgical excision is accomplished by either lobectomy or pneumonectomy. It is in the technic and successes of thoracic surgery that some of the most remarkable advances have been made during the past few years. For instance, in 1920, Sauerbruch collected or reported 15 surgical extirpations of the lung. In 1934, Heuer found reports in the literature of 225 lobectomies and pneumonectomies of which 33 were for pulmonary carcinoma.

Allen and Smith, in 1932, performed the first successful two-stage lobectomy for carcinoma. In the first stage, the parietal pleura of the lobes which were retained was scarified to form adhesions and isolate the lobe to be removed. At the second operation, the diseased lobe was excised. The patient was living and well four and one-half years later. Graham and Singer, in 1933, performed

the first successful one-stage left pneumonectomy for pulmonary carcinoma. In this operation, a posterolateral approach was used and a thoracoplasty was performed. Shortly following this case report, Overholt described the first successful right pneumonectomy for carcinoma. At present, an anterior approach for ligation of the bronchus and vessels and a posterior incision for delivery of the extirpated lung appear to be the most popular surgical procedures. Also, opinion now favors avoiding

thoracoplasty at the initial operation, and doing it only if necessary later.

Irrespective of the surgical procedure used, radical surgical excision is the treatment of choice, and it alone offers a reasonable likelihood of cure. Here again, it is apparent that the crux of the whole problem of pulmonary cancer is early diagnosis. It is sincerely hoped that this discussion may help in making earlier diagnoses, and consequently in increasing the number of surgical successes.

A New Theory of Physiology of the Sinuses*

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PROBABLY no anatomical structure in the body has been the object of so much idle theorizing as to its function as has been the case with the nasal accessory sinuses. It would seem that every possible theory has been advanced regarding the purpose or purposes of the sinuses. Whether these cavities evenly distribute the inspired air and thus help olfaction as Strickland¹ and others have mentioned is certainly a debatable question. Just how these little cavities are supposed to be of help in such a rôle has not been explained in any practical way. Nor does the contention so often brought forward that they are placed there to lighten the bones of the head seem to be at all logical. Surely, the head could have been made just as light by making it smaller instead of filling it full of holes. Considering the misery and discomfort brought to us by the sinuses, such a reason for their existence hardly seems plausible. Furthermore, if such were their purposes, why were not the apertures made large enough so that they would not cause trouble from poor drainage?

Kistner² has shown that the mucosa of the sinuses have phagocytic properties and he was "able to stain the organisms in the tissue in the same relative numbers as we recovered them in culture." Some men have taken this fact to prove that the sinus mucosa takes part in auto-immunization. This contention seems far-fetched if not absolutely unfounded. It is very common for an acute upper respiratory infection to commence in the nose, travel from one sinus to another, invade the throat and then the lungs. By the time the throat is infected and a bronchitis or bronchial pneumonia has developed, the nose may be completely well. If the sinus mucosa created an immunity, why did the infection continue to spread and get worse? On the other hand, the infection may commence in the throat and travel to the nose; by the time it reaches the nose, the throat is healed. If the body needed the supposed immunizing effect of the sinus mucosa to heal the throat infection, how did the throat

happen to get well by the time the nose became infected? It seems that many upper respiratory infections travel along much as erysipelas travels on the skin. There would appear to be no more justification to giving the sinus mucosa a rôle of auto-immunization than there would be to saying that if the patient had had a bigger ear for the erysipelas to travel over, he would have recovered more rapidly.

Nor does the contention that the sinuses are an adjunct to respiration for moistening the air seem to be at all plausible. Oppenheimer says that such a contention is false because histologic findings prove that there are practically no mucous glands in the mucosa of these cavities.

Shea³ seems to have solved the problem to his satisfaction by saying, "They act as reserve chambers during respiration." (Just what he means by reserve chambers, he has not made clear) "And as hollow spaces, lighten the cranium and our tones are more resonant because of them. The frontal and sphenoid sinuses are given to intelligent information in our complicated system of equilibrium, which is shown by the fact that vertigo is a symptom of acute frontal sinusitis, or the result of an osteoma within the frontal sinus." He is not satisfied with these vagaries but proceeds further to say, "the most plausible service of the sinuses is to play an intricate part in establishing and maintaining our immunity to infections of our environment. The early removal of the principals of Waldeyer's ring leaves a greater burden on the remainder of the immunizing apparatus. The occurrence of the above explains why we are seeing more sinusitis today in the young. Occasionally you will see an acute sinusitis develop in a patient of any age as a result of an unsuccessful attempt of the sinuses to help the system overcome an acute tonsillitis." So in the same breath he says that removal of the tonsils causes sinusitis and then that the failure to remove them causes sinusitis. However, he is not even content to stop here, but goes on to bring in the modern bugbear of the medical pro-

*Read before the North Dakota Academy of Ophthalmology and Otolaryngology, May 17, 1938.

fession, namely, the endocrines. He dwells at length on a supposed relationship between the nose and the sex organs, giving us quotations from Schaefer⁴ in part as follows, "Certain sexual conditions seem to have a nasal reference and vice versa, e. g., some nasal disorders seemingly are the result of sexual irritation or disease. Indeed, there are some striking anatomic and physiologic analogies between certain portions of the sexual organs and the nose. Menstrual life may be established by the occurrence of nasal bleeding. Turgescence of the erectile tissue of the nasal fossae may regularly accompany menstruation in women with a normal nasal mucous membrane."

I quote this article, reeking as it does with medieval theorizing and suppositioning, because it is such a glowing example of the trash and muck that we are compelled to wallow through in our medical literature in a too often futile attempt to glean a few grains of truth for our starving intellects.

With such vivid imaginations put to work in concocting excuses and purposes for the sinuses, I am indeed surprised to find no mention made of the simple purpose to which I attribute the presence of the sinuses.

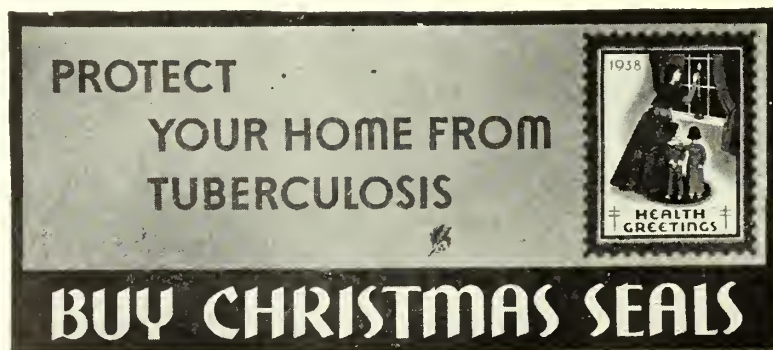
Let us consider first the structure of the sinuses—hollow cavities, well supplied with lymph drainage, provided with very small openings in inaccessible places, for the most part beneath the turbinates. Why were these openings made so small when all that we rhinologists feel that we have to do to heal a sinus infection is to make the openings larger? Why did not nature make them larger in the first place and avoid all this trouble? *The answer appears to be that they would not have served the purpose for which they were really intended, had the foramina been made larger.*

Now let us consider what happens when we have an acute rhinitis. The secretions of the nose are gradually sucked up into the sinuses as the air in the sinuses absorbs. Then by violent blowing of the nose, we empty

the sinuses. Anyone who has had rhinitis will recall blowing from the nose large quantities of pus in the morning upon arising. This pus came from the sinuses where it had been gradually sucked in by the negative pressure caused by gradual absorption of the air contained in the sinuses. The violent blowing of the nose removed it much in the same way as we instill ephedrine into the sinuses by the suction displacement treatment. It appears to me that the easiest way to satisfy ourselves as to the purpose of the sinuses is to imagine what would happen to us, did we not have these sinuses. Suppose the nose were just two hollow passages with three turbinates. What would happen to the secretion from an acute rhinitis? It would be constantly pouring forward onto the lips and backward into the throat. By morning, the pillow would be saturated, in a day or two, the lips and most of the rest of the face would be infected with a dermatitis from the constantly dribbling secretion, the throat and larynx probably would be involved and we would be in danger of aspiration pneumonia every moment of our sleeping hours. Does it not seem logical that since the sinuses serve such an important rôle during the time of an acute rhinitis, since they are constructed in the only way that they could be constructed and still serve that rôle, and since considering the trouble they cause, nature surely would have made them differently had she not intended them for this rôle? I ask why, since all of these facts are obvious and self-evident, we cannot assume this simple yet important function to be the rôle of the sinuses?

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Head Injuries*

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IN every country in which the more rapid methods of transportation have been introduced, the problem of head injuries has become a more serious problem than ever before. As every physician may be called upon to take care of such cases, it is of prime importance that their treatment should be properly understood. In order to institute an intelligent plan of procedure, it is well to consider first the pathological changes that may occur in such injuries, then the anatomical and physiological mechanisms that may be distributed; with these facts as a background, we must outline a rational treatment.

When an individual receives a blow on the head, several things may happen. There may be only a laceration of the scalp, or a fracture of the skull without injury to the intracranial contents, or there may be various types of injury to the brain and membranes covering it. What makes head injuries serious is not what happens to the bone, but what happens to the intracranial contents. The brain injury is what we must always keep in mind.

FIRST: If the blow is a light one, the patient may not even be unconscious. He may vomit, have a slow pulse for a short period of time, and then complain of headache. Such patients rarely die from the injury and it is somewhat conjectural what the underlying pathology may be. It may be that he merely has a slight bruise of his brain. This may give rise to a transient cerebral edema. This is about the only type of cerebral injury that I think we are justified in calling a concussion. If the patient has severe headache, the administration of hypertonic solutions will often give prompt relief, but as the edema is likely to recur this must be repeated. In addition, the patient should be kept quiet in bed for a few days. Any patient who has more than such a very mild injury should be kept in bed for several weeks in order to avoid some of the late complications to which I shall refer later in this paper.

SECOND: There may be a fracture of the skull. Such fractures may be linear, comminuted, or depressed, and may be simple or compound. The fracture may involve only the vault or also involve the base of the skull. I have never seen any purpose in trying to distinguish between vault and basal fractures. It is usually said that basal fractures are more serious than vault fractures. That is an unfortunate statement, as it is likely to be misleading. An injury that is severe enough to cause a fracture at the base, where the bones are much thicker and more protected than in the vault, causes, as a rule, more intracranial damage. Because of the greater brain damage they may be more serious, but not on account of the fracture.

There is no treatment indicated for the fracture itself unless the fracture is depressed. Because of the harm it may do to the brain, the depressed bone should be

elevated. The depressed bone may have contused and lacerated the brain and the scar that forms may be later on, sometimes years later, the cause of epileptic convulsions. Sometimes depressed fractures cause headache and, to avoid either epilepsy or headache, elevation of the fragments is, I believe, desirable. Even if the depressed fracture gives rise to no symptoms at the time of the injury, I believe the fragments should be elevated.

If the fracture is a compound one, of course the wound should be promptly debrided and, if it is seen in the first 24 hours, should be sewed up without drainage. When such a wound is debrided, it is important to be thorough and radical; an incomplete debridement is almost as bad as doing nothing. If the bone is soiled, as much as necessary must be removed, and if the dura has been torn and the brain lacerated, the torn edges of the dura must be excised and the lacerated brain be removed. Macerated brain tissue forms an ideal medium for bacteria to grow in and also forms much more scar tissue. Both to avoid the immediate danger of infection and the later one of epilepsy, a radical debridement is important. Such an operation may be a formidable procedure. Removing large areas of brain tissue requires proper facilities for the control of hemorrhage. Suction and electric coagulation are very helpful and simplify the procedure.

THIRD: There may be a hemorrhage, either arterial or venous in origin. The arterial hemorrhages are, as a rule, extradural and come from an injury to the middle meningeal artery or one of its branches. These cases have a very characteristic history. The patient may have a brief period of unconsciousness from the blow and then regain consciousness, and remain conscious for a varying period of time—anywhere from a few minutes to an hour. This is spoken of as the lucid interval. Then he gradually lapses into unconsciousness and, if the hemorrhage is not stopped, the coma becomes deeper and ends in death. This second period of unconsciousness is due to the increasing hemorrhage and associated increased intracranial pressure; as the hemorrhage progresses, frequent blood pressure readings will at times reveal a steadily rising systolic pressure and a slowing of the pulse. These cases require prompt operation. The operation can be carried out through a vertical incision through the temporal muscle. In deciding on which side of the head the hemorrhage has occurred, the surgeon must be guided by the neurological symptoms and not by the location of the injury. Thus, if the patient has received a blow on the right side of the head but the symptoms show involvement of the right pyramidal tract, the hemorrhage is over the left cerebral hemisphere and not on the side on which the blow has occurred.

The venous hemorrhages give a very different history. The blood clot is subdural, not extradural as in an arterial hemorrhage; one of the veins running into the

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longitudinal sinus gives way. The injury frequently has been a very slight one and often is so insignificant that no history of injury is obtained. Whereas middle meningeal hemorrhages call for prompt surgical interference, venous hemorrhages develop slowly and produce that very interesting condition about which a good deal has been written in the last few years—a subdural hematoma. The symptoms may come on after weeks or months and in one of our cases came after three years. Just why these subdural hematomas give symptoms after such a long latent period is still a question that is under discussion. According to one theory, there is slow bleeding going on, but this seems highly improbable. Slow bleeding from a cerebral vein lasting months hardly seems possible. The other theory recently advanced that the contents of the hematoma increase in size by osmosis is very interesting and may be a possible explanation. The diagnosis of a subdural hematoma is often difficult. The patient presents the picture of increased intracranial pressure, headache and choked discs, and often nothing else. There may be pyramidal tract signs, more frequently there are none. In fact, it is unusual to have localizing signs in a case of subdural hematoma. At times, the patients show marked mental changes and are thought to have a beginning psychosis. The location of the lesion may have to be made by ventriculography or small perforator openings over each hemisphere.

The treatment consists in evacuating the hematoma but men differ how this had best be done. One group believes that an osteoplastic flap should be turned down and the hematoma evacuated, and as much as possible of the membrane surrounding the hematoma be removed; the other group believes that making two small trephine openings, one over the frontal region, the other in the postparietal region, and then washing through, is enough. In my experience this is not always satisfactory; in some cases in which I have done this I either lost the patient or had to turn a bone flap subsequently.

From what I have said thus far, it might appear to you that I believe that operation is the method of treatment usually to be used in head injuries. Such a conclusion, however, is quite wrong. I have merely spoken first of those conditions which require operation in order to dispose of them. I have kept for final consideration the **FOURTH GROUP** into which fall the vast majority of head injuries, a group in which operation rarely, if ever, is indicated.

By far the most frequent lesion in a head injury is contusion and laceration of the brain, with or without fracture, and without frank hemorrhage. These are the patients that are brought into the hospital unconscious, with no rising blood pressure indicating a meningeal hemorrhage. The pulse may be rapid, they may be restless and toss around, the breathing may be irregular, even Cheyne-Stokes. The reflexes may be abnormal on one or both sides. These cases fall into two groups: (1) There may be so much brain injury that absolutely nothing can be done, and, in spite of any treatment, death occurs in a few hours. (2) The other group of

cases may also have a severe brain injury but the principal cause of the unconsciousness is the associated cerebral edema. Brain tissue becomes edematous readily and rapidly. Nothing can be done for the contused and lacerated brain, but a great deal can be done to clear up the cerebral edema. The problem, therefore, resolves itself into the treatment of this edema.

There are three methods of doing this. One is to enlarge the cranial cavity by operation to make room for the edematous brain; this is what we used to do 15 years ago but have given up entirely today. We used to do a subtemporal decompression. We realized that it was often an inadequate procedure but we had no other method.

Then, almost 20 years ago, Weed and McKibben discovered experimentally that by injecting hypertonic salt solution into the circulation, it was possible to shrink the brain. This discovery was promptly applied clinically to head cases with an injury such as I have just described. At first, we used hypertonic sodium chloride intravenously, a saturated solution, but now we find we can accomplish the same thing either by giving 50 per cent intravenous glucose or 50 per cent sucrose; the latter substance has the advantage that it is not absorbed but excreted in the same form. The dehydration effect can also be accomplished by giving a saturated solution of magnesium sulphate as a retention enema. This solution has to be kept in the rectum mechanically for 10 or 15 minutes and then the patient expels a big watery stool. This is repeated every three or four hours and, as the patient improves, the interval of injection is lengthened.

There is still a third method of treatment which is used to a very great extent in many hospitals and to which I personally am very much opposed. I do not allow it to be used in my clinic. The problem, as I have said, is to make more room for this edematous brain. If you collapse the ventricles by removing cerebrospinal fluid by lumbar puncture, you make more room and the compressed brain takes the place of the ventricles. The reason I object to this is because I have seen a number of deaths as a result of lumbar puncture in these cases. The deaths do not always occur immediately. They sometimes occur in the course of a few hours. The mechanism, of course, is a very simple one. With the withdrawal of cerebrospinal fluid, the cerebellum sinks down into the foramen magnum, presses on the medulla and interferes with respiration. These cases practically always die from respiratory failure and not from cardiac failure. Because of this danger and because, in my experience, the handling of cerebral edema can be done just as effectively and with no danger by using hypertonic fluids, we do not use spinal puncture to deal with this problem.

In summing up I have this to say: Except for the rather rare cases that I first mentioned, which require operation, the problem in the vast majority of head injuries is the control of cerebral edema, and this, in my experience, is most effectively done by applying dehydration in one of the various ways I have just described.

The Diagnosis of Acute Abdominal Conditions*

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THE diagnosis of acute abdominal conditions has that element of chance or speculation in it which quickens the interest of the seasoned veteran and the new recruit alike. Whenever diagnoses depend on histories and human interpretations they have in their final analysis a factor of error which will vary greatly. This factor is made up of the history of onset, the subjective interpretation of the symptoms and the degree of precision applied in eliciting objective findings. Where is there an attending surgeon who has not been humiliated by having a junior interne make the correct diagnosis after the surgeon had pointed out many reasons why such a diagnosis could not obtain in that particular case?

I remember distinctly a case which was diagnosed and operated on by a very distinguished surgeon as an acute gall bladder condition. When the abdomen was opened, a gall bladder was found which contained several large stones but showed very little evidence of recent disturbance. After a careful search of the upper abdomen, the gall bladder was removed and the patient returned to bed. Two days later the patient had another attack of acute pain in the upper abdomen and went into shock. The attending surgeon was convinced that some intraperitoneal accident had occurred. The patient was hurried to the operating room and the previous incision re-opened. Exploration of the abdomen did not disclose the cause of the pain. The patient succumbed within a short time and the autopsy revealed a dissecting aneurism of the aorta. Such a mistake in diagnosis is a calamity. It happened to him and it can happen to you and me.

It is a happy turn of events when the mistakes in diagnosis are followed by no morbidity or mortality. It makes little difference if one makes a diagnosis of acute appendicitis and then finds that the condition is one of acute diverticulitis of Meckel's diverticulum. Both conditions demand immediate operation and both conditions can be reached through an incision made for either. If it were all as simple as this, there would be little necessity for stressing the importance of careful, painstaking examination in every acute painful condition of the abdomen.

There are times when, even after a careful study of the development of the various symptoms and their relationships to one another in connection with the physical and laboratory examinations, that two or more conditions must be considered. The law of averages is a great stabilizer and bears the same relation to surgical diagnosis that the bookmaker's figures do to racing. In either case a dark horse may appear and upset all predictions.

I recently saw in consultation a man 61 years of age who gave a history of mild dyspepsia dating back several years. Occasional acute attacks of abdominal pain had occurred. While visiting in Chicago, he was seized with acute generalized pain over the abdomen which grew steadily worse but showed little tendency to localize. When admitted to the hospital, his entire abdomen was slightly distended and a mild jaundice (icterus index of 40) was present. A leucocytosis of 25,000 was found and the temperature ranged around 102°. No mass could be felt anywhere and no marked rigidity could be elicited over McBurney's point. The patient had no chills or sweats. A diagnosis of acute gall bladder disease was made and the gall bladder drained. The gall bladder did not show much change and it was suggested that the pancreas might be involved. The patient continued to become more toxic and died on the tenth day. Autopsy revealed a perforated retro-ileal abscessed appendix with pyelephlebitis.

The appendix is still the ranking offender in acute abdominal conditions. I asked the executive Admission Room resident at Cook County Hospital to check up on the admissions for one month and give me the report of the acute abdominal conditions which were admitted. I asked him to supplement this report with some notes on his follow-up of these admissions. An abstract of his report is given here.

Of 136 cases admitted as acute surgical abdomens during this month, 54 were diagnosed as acute appendicitis (40 per cent). The importance of the chronology of the symptoms in appendicitis was stressed by Murphy and it is just as important today. Eighty per cent of our cases began with diffuse abdominal pain. Only 20 per cent said they first felt pain in the right side. Nearly every patient was very clear as to the exact time when the pain began and I think this is an important point. Seventy-five per cent of the appendicitis patients had taken cathartics and an equal per cent was convinced that some dietary indiscretion was the sole cause of their affliction. The absence of a marked leucocytosis in over one-half of our admissions seems to detract from its importance as a diagnostic means in the early case. The presence of a high leucocyte count early in the condition was regarded with suspicion rather than as confirmatory.

Forty-eight of the 136 admissions in this group (35.5 per cent) proved to be acute salpingitis. It was a startling discovery to find that the women admitted had salpingitis more often than appendicitis. I dare say this is a local situation but it is interesting. Careful analysis of the onset in these cases leaves one with the distinct impression that the patient is indecisive as to the exact time when severe pain began. The pain is commonly described as beginning in the lower abdomen and remaining in practically the same area in which it was first noted. The history and physical findings will enable

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one to make a reasonably certain diagnosis in nine of ten cases but the tenth case will necessitate further study or operation to confirm the diagnosis.

Thus in our small series it will be seen that 75.5 per cent of acute abdominal conditions fell under the head of either appendicitis or salpingitis.

The next most common acute abdominal condition was intestinal obstruction. While one might speak at length on this condition, the first paragraph would probably be of most interest. Ninety per cent of acute obstructions occurred as a result of postoperative bands and adhesions, strangulated hernias and malignancy. The symptoms plus a roentgenographic study usually make the diagnosis. From the surgeon's side, it might be well to utter a word of caution against the administration of barium by mouth in obstructed cases. This injudicious use of barium and the attempt to explore distended abdomens under local anesthesia have been two black spots on the escutcheon of surgery. Some exception may be taken to the arraignment of the surgeon for the use of barium by mouth, but I believe that he is responsible indirectly in most instances.

Acute conditions of the gall bladder and biliary tract made up 6.6 per cent of the cases studied. This proved to be a disease of middle age in our series and the early localization and constancy of pain in the right upper quadrant was impressive. Vomiting came on early and persisted in a substantial number. It was remarked by several who reviewed these cases that the onset seemed to occur during the night often waking the patient with a severe pain. In practically all the cases, the pain in the early stages was colicky and intermittent. Later it became more continuous in character and the tenderness more definitely localized. In addition to the observations made in this group study, it is suggested that more attention be given to the pre-operative study of the heart in cases of gall bladder disease in middle-aged men. Numerous authors have called attention to the confusion that may result from coronary disease. These patients frequently give a history of intestinal upsets extending over a period of several years. The culminating attack may give rise to terrific pain in the epigastric region followed by nausea and vomiting and a leucocytosis may appear. Rigidity of the muscles of the upper abdomen may be very marked and adds to its simulation of gall bladder disease. That the problem cannot be immediately settled by taking an electrocardiogram is revealed by a case in my private practice. I was called in consultation to see a man 37 years of age who had had several attacks of severe epigastric pain which were also accompanied by pain in the precordial area and some pain in the left shoulder. Two eminent internists were debating the evidence presented by X-rays of the gall bladder and electrocardiograms. There were some findings in the electrocardiograms suggestive of coronary disease and two wheat kernel-sized opacities were present in the flat plates of the gall bladder. Some eight years before the present trouble the patient had his gall bladder drained for an acute cholecystitis. No agreement as to the cause of the attacks was reached by the consultants but both acquiesced in an exploration of the gall bladder. The gall bladder was about normal in size with thickened

walls. It contained normal bile and in the pars convoluta of the cystic duct there were two stones about 1 cm. long and .3 cm. wide. The gall bladder and duct containing the stones were removed. The patient made a normal uninterrupted convalescence. Subsequent repeated electrocardiograms have not revealed any changes suggestive of coronary disease. The patient has had no more attacks of epigastric pain. Notwithstanding the outcome of this case, every surgeon should regard acute upper abdominal attacks in middle-aged men with suspicion. Some may prove to be coronary attacks. To operate coronary cases would probably be calamitous.

Ruptured peptic ulcer occurred in six of the 136 cases (4.4 per cent). Not a case occurred in a woman. Only two ruptured peptic ulcers have occurred in women admitted to the Cook County Hospital in the past 12 months. Only 50 per cent of our admissions gave an ulcer type history. The onset occurred in most of the patients while they were engaged in manual labor. Many patients described the onset as terrific and said that the pain knocked them down. It was severe, to say the least, and in all six patients it was continuous in character. It appeared in several cases that the pain came in surging intensity as the leakage increased. No patient seemed to want to move about. Air beneath the diaphragm could be demonstrated in 80 per cent of the cases by fluoroscopy.

Pyelitis was the cause of pain and acute abdominal symptoms in three cases (2.2 per cent). The indefinite character of the abdominal findings objectively was confusing but the lumbar pain was helpful in every case. The occurrence of chills was helpful and the early high leucocyte count and the clumped masses of leucocytes in the catheterized specimen aided in definitely clinching the diagnosis.

Ectopic pregnancy contributed two cases in the total number. Most cases give a history of irregular menstruation. A recent case coming to my attention at Wesley Hospital had no menstrual irregularity but the occurrence of a sudden abdominal catastrophe exactly four weeks from her last menstruation was suggestive. She was admitted one hour before her death and her red cell count was reported as 1,400,000. She appeared exsanguinated and expired before a transfusion could be given although salt solution was being given intravenously. The occurrence of frequent micturition and defecation is common when the bleeding is profuse.

One case of tabetic crisis was admitted in this series, but no difficulty in diagnosis was encountered. The presence of tabes is not itself a guarantee that an acute abdominal condition other than a tabetic crisis may not occur. This was eloquently attested to by a perforated peptic ulcer that occurred in our service this past year. Mesenteric adenitis presented one case which was diagnosed as appendicitis and the appendix was removed although doubt was expressed about its being the cause of the symptoms. The ileo-colic group of glands was acutely inflamed but not fluctuant, nor had any ruptured. One case of ruptured ovarian follicle was admitted and operated on under the diagnosis of ruptured ectopic pregnancy. The one pneumonia case with acute pleurisy of the right side was very confusing. The rapid

elevation of temperature to 103°F by mouth was regarded as suggestive of bacteriemia. The leucocyte count on first examination was 24,000 with 86 per cent polymorphonuclears. Friction sounds were found when the patient was gone over in the ward. The admission room diagnosis was occasioned by the severe pain in the upper abdomen.

SUMMARY

A small group of acute abdominal conditions was studied. An attempt was made to emphasize those findings which were particularly valuable in making a diagnosis. Attention was also called to some findings which are usually regarded as helpful but were absent or not convincing in this series. The interest stimulated by personal analysis of small groups at frequent intervals should lead to better diagnoses.

CONCLUSIONS

A small series of cases may offer fruitful study to any surgeon. A recent editorial in the *Western Journal of*

Surgery, Obstetrics and Gynecology, so clearly expresses my attitude toward such a presentation as this that I quote it verbatim: "The rank and file of us are too prone to cry over our lack of opportunity—the remoteness of available material for the preparation of worthwhile research and clinical papers. What is to prevent any surgeon who keeps decent records from pursuing precisely such a course? As a matter of fact what excuse has the average surgeon for not pursuing precisely such a course? Naturally, where smaller groups of cases are involved, publication is neither required nor expected. On the other hand, it must not be thought that a casual glance back over the years, with no thought of getting down to brass tacks, can give us any sort of honest analysis of our results and the multiplicity of factors which contribute toward them."

Any surgeon should enjoy a careful analysis of admission and pre-operative diagnoses in the light of their subsequent course and operative findings.

Puerperal Sepsis*

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STRICTLY speaking, the term "puerperal sepsis" refers to any infectious process which may occur during the puerperium. Actually, although as practitioners of medicine and of obstetrics we are interested in and must treat any of the infectious possibilities within the entire field of medicine which may occur during the puerperium, our interest centers around those infections which have their origin in the genital apparatus. These are wound infections resulting from the introduction of pyogenic bacteria into the genital tract either before, during, or immediately after labor, from organisms already existent in the vagina or cervix, or elsewhere in the body of the woman prior to the onset of labor. From a clinical standpoint, it is frequently difficult to know at the time whether or not a fever during the puerperium is caused by genital infection. Consequently, it is best to consider *all* fevers arising during the puerperal course of the patient to be genital in origin unless definite proof can be elicited that they have arisen from some other source.

Puerperal infection has undoubtedly occurred ever since women have been bearing children. Because, between the development and growth of lying-in hospitals until the time of Pasteur, the mortality rate from puerperal sepsis was appalling, we cannot even today, hear the term without experiencing a sense of dread. Such foreboding and fear of the disease is justifiable, but it

is, nevertheless, necessary to point out that there are many women who have minor grades of puerperal sepsis to which they do not succumb. It is also necessary to arrive at a common understanding of what is meant by puerperal sepsis.

INCIDENCE

In the Iowa Clinic, any patient whose temperature rises above 100.4° F. is recorded as having a febrile puerperium. Fevers which occur on the day of delivery and never again while the patient is under observation, are recorded separately as "intrapartum infection," and are not grouped with the general class of puerperal sepsis. In other words, any patient who has a fever at any time during the puerperium, except during the first 24 hours, is listed among the septic cases. However, a distinction is made between those women with one-day fevers, whose temperatures remain above 100.4° for less than 24 hours, and those with fever lasting two or more days. Also, temperatures are taken and recorded every four hours, so that all fevers are recognized. Naturally, many women who have a minor febrile course are, therefore, included among the group of patients with puerperal sepsis. These facts must be borne in mind when considering the figures for puerperal morbidity.

It is difficult to make accurate statements concerning the frequency of puerperal infection, hence the figures for the Iowa Clinic during the ten months, May, 1937, to February, 1938, inclusive, are presented. There were

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1,030 women delivered during this period, and among these, there were 296 with fevers of 100.4° F. or more, an incidence of 28.7 per cent. However, 179 of these 296 women had one-day fevers, so that only 117, an incidence of 11.4 per cent, had fevers persisting more than 24 hours. Of this latter group, only 26 women were considered to be sufficiently ill to warrant the employment of sulphanilamide in their treatment. There were no deaths from puerperal sepsis during the period under consideration.

BACTERIOLOGY

With all the refinements of present-day bacteriologic technic, there has been considerable revision in the classification of the organisms concerned in the production of puerperal fever. There are many of these organisms, but the seven most common, in order of frequency, are: anaerobic streptococci, anaerobic staphylococci, anaerobic nonhemolytic streptococci, anaerobic diphtheroids, anaerobic facultative streptococci, aerobic diphtheroids, lactobacilli. However, in over 90 per cent of patients, these organisms are not found in pure culture but are mixed with one or more of the others. Of the anaerobic and aerobic streptococci, which traditionally are associated in our minds with puerperal sepsis, the anaerobic types cause slightly more than half of the cases. In other words, no particular type of organism is specific for puerperal infection. Certain of the organisms are commonly associated with localized infections while others give rise to the more generalized ones. This fact is occasionally noticed clinically. For example, two winters ago, practically every patient with puerperal sepsis developed a pelvic cellulitis, localized in one or the other parametrium. On the other hand, during a minor epidemic of sepsis, three of eight moderately ill patients developed septicemia, however, with recovery. The ubiquitous gonococcus is a rather frequent causative agent of fever during the puerperium, it being generally agreed that one-sixth to one-tenth of sepsis is due to it. In this connection, it is of interest to note some recent work done by a member of the obstetric staff at the University of Iowa. In an effort to ascertain something concerning the incidence and the best method of diagnosing latent gonorrhea, 337 consecutive patients were studied during the last weeks of pregnancy. In none of these women was there a history of gonorrhea, and so far as the patient or the medical staff knew there was no indication whatsoever of the presence of the gonococcus. However, the organism was demonstrated in 15 women. Each of these 15, therefore, was unknowingly and unsuspectingly a potential candidate for the subsequent development of puerperal gonorrheal pelvic inflammatory disease.

PATHOLOGY

Puerperal fever, it is generally conceded, arises from the genital tract and is acquired just before, during, or immediately after delivery. It is a wound infection and the initial site of invasion is the placental area with its bleeding, raw surface and the large, gaping thrombosed placental sinuses. Although endometritis is by far the most common lesion, nevertheless, vaginitis, vulvitis and infection of healing vulval wounds, are not uncommon.

Generally, however, such lesions are secondary to the endometritis. For example, episiotomies and perineal repairs seldom break down unless the wound is being constantly bathed by lochia containing large numbers of virile organisms arising from an endometritis. After gaining a foothold in the placental site, the infection may be confined there or spread over the interior of the whole uterus. In the latter event, the lesions vary considerably according to the micro-organism concerned, and still more according to their virulence. The less virulent organisms tend to remain confined to the endometrium, and produce a sloughing, putrid area made up of necrotic material and decidual debris, bathed with a foul-smelling, bloody, purulent discharge. This is the so-called saprophytic, or putrid endometritis. On the other hand, when the infection is virulent, there is practically no local response, the inner surface of such a uterus appearing to be practically clean. The organism grows with such rapidity in the favorable soil that it sweeps through the primary defenses into the pelvic cellular tissue, leaving hardly a trace of its passage at the site of initial invasion. Naturally, this discharge is scanty and comparatively free from odor.

Although the various organisms concerned in puerperal fever vary in virulence, nevertheless, they practically never spread upward by contiguity of mucous surfaces to invade the fallopian tubes. Apparently these bacteria either promptly pierce the uterine wall and invade the pelvic cellular tissue, or they remain confined to the uterine cavity. On the other hand, the gonococcus has very little invasive power. It grows slowly compared with the streptococcus and the staphylococcus, and consequently tends to be confined to the natural cavities. In fact, it grows so slowly that it is still growing by the time the interstitial portions of the fallopian tubes become patent following delivery, so that toward the end of the puerperium it is possible for it to spread into them. This distinction should be emphasized. The usual micro-organisms of puerperal sepsis either pierce the uterine wall and spread rapidly into the cellular tissue, or else they die off within the first week of the puerperium, and the infection subsides. Consequently, such organisms rarely, if ever, produce salpingo-oophoritis. The gonococcus, however, at about the ninth day, usually does invade the fallopian tubes causing salpingo-oophoritis. This concept is of considerable importance from a clinical standpoint.

Having passed the primary defenses of the uterus before the body has had time to mobilize a leucocytic barrier, the virulent organism may or may not be checked in the secondary defenses built up by the pelvic cellular tissue. In the event that it is checked, a pelvic cellulitis develops and may eventuate into any one of three possibilities: it may remain as a gradually subsiding cellulitis, which resolves by itself; it may localize into an abscess with the formation of a definite cavity filled with pus; it may develop into a bony hard induration lying against the pelvic wall. These bony hard phlegmons persist for months, eventually subsiding without causing more than a low grade fever and a prolonged period of malaise. It must be recognized that each of these three

possibilities may occur anywhere in the pelvic cellular tissue.

Abscess, when it does occur, arises from a parametritis occupying the base of the broad ligament. It gradually dissects anteriorly between the peritoneal leaves of the broad ligament becoming larger and larger until the grape-fruit sized swelling adheres to the peritoneum of the anterior abdominal wall and is palpable abdominally. Abscesses, if not drained surgically, may rupture through the abdominal wall, pierce through the obturator foramen coming to lie under the gluteus muscle, rupture into the peritoneal cavity causing a peritonitis, or follow the iliac vessels through the femoral ring, forming a secondary abscess by extension into Scarpa's triangle. Inasmuch as the cellular tissue lies between the peritoneum and the underlying muscle fascias, surrounds and invests all of the pelvic organs, extends to the lateral pelvic wall between the leaves of the broad ligament, splits to extend upward toward the kidney, and downward between the symphysis and the urinary bladder, it is readily seen that simple cellulitis, abscess or phlegmon may occur almost anywhere in the pelvis. They are, however, invariably *extra-peritoneal*. If the abdomen be opened, the peritoneum will be seen to be quite normal except for the projecting swelling.

If both the primary defense of the uterus and the secondary defense of the cellular tissues are ineffective in limiting the spread of the extremely virulent organism, access is gained to the general body system or to the peritoneal cavity, usually by way of lymphatics and blood vessels. Septicemia and pyemia are extremely serious, although not necessarily fatal consequences of a rapidly spreading infection. Pyemia usually results from the infection of thrombi at the placental site with subsequent development of inflammatory changes in the veins. These thromboses may remain confined to the veins of the uterine wall, where they give rise to small abscesses. More commonly the process extends outside the uterus, to include the veins of the pelvis, and possibly of the legs. Metastatic abscesses may develop as the result of the breaking off of embolic particles of the thrombus. Sometimes the thrombotic process may remain as a low-grade infection until about the fourteenth day at which time a full-blown thrombophlebitis of the major veins of the leg develops. It is also possible for this to develop by lymphatic extension from a pelvic cellulitis. Peritonitis is such a grave complication that most of the women developing it after an obstetric episode succumb.

ETIOLOGY

As it has been conclusively demonstrated that the bacteria concerned in puerperal sepsis are identical with those with which we are familiar as causing many of the ordinary types of infection, it must follow that these pathogenic micro-organisms have a wide and general distribution. There are several ways by which they may gain access to the genital tract of a woman in labor.

Primary Causes: The introduction of antisepsis and the development of asepsis has done much to lower the maternal mortality rate from puerperal sepsis. No modern physician or hospital would think of conducting a labor without taking all of the known steps to prevent

the introduction of virulent organisms by way of instruments or the hands of the attendants. The technic of preparation of instruments and attendants' hands is so common-place today that it may almost be accepted without question. However, breaks in technic do occur, and unfortunately, there are still some men who do not use the same care in conducting a labor that they would in opening an abdomen. Consequently, one must be constantly upon his guard to avoid the careless introduction of a pathogenic micro-organism. Rectal examinations are generally considered to be safer than vaginal, even when the vaginal examination is conducted only after the most scrupulous surgical preparation of the hands and with the use of boiled rubber gloves. It is, of course, recognized that under certain conditions, it is not possible to obtain all the desired information from a rectal examination, and then vaginal touch must be employed, but the physician who has trained himself in the technic of rectal examination will need to resort to the use of vaginal examinations in less than 15 per cent of cases.

Following a serious epidemic of puerperal infection in the Sloane Hospital for Women in New York in 1927, attention was directed to the possibility of infection from air contamination by hemolytic streptococci contained in the air passages of the medical and nursing personnel. When one considers that the nose and mouth of an attendant is at times in very close juxtaposition to the vulva of the parturient woman, the idea of infection from a carrier does not seem to be so far-fetched. At any rate, this source of infection must be eliminated by the exclusion of carriers and the wearing of adequate masks.

Auto-infection is always a potent possibility. Because it is generally conceded that if uterine infection does occur as the result of streptococci in the respiratory passages of the patient herself, the organisms reach the genital passages by contact and not by the blood stream, every effort should be made to prevent this contact. In this connection, a tragic case, seen in consultation, comes to mind. The patient was the wife of an oto-laryngologist. Her four-year-old son had recently been treated by radical mastoidectomy for a severe ear infection and the mother, then in the last trimester of pregnancy, had taken care of him. When first seen, the patient was five days postpartum, and obviously was suffering from a beginning peritonitis. She died at the classic time; the tenth day after delivery. In addition to infection carried to the genital region by the patient herself, the introduction of bacteria through sexual intercourse in the last days of pregnancy may be a factor in the explanation of certain obscure cases of sepsis.

Contributing Causes: So far, only the virulence of the micro-organism has been considered. There is another, and a potent factor which deserves some consideration, namely: the resistance of the host. Obviously, the loss of considerable quantities of blood lowers the resistance of the puerperal woman. Patients who lose up to a quart of blood at labor, especially if they have undergone considerable trauma, almost invariably develop sepsis unless some attempt is made to replenish the loss by transfusion. Still other predisposing factors in the etiology of puerperal sepsis are pre-eclamptic toxemias and eclamp-

sia. Apparently such patients do not adequately resist invasion by pathogenic bacteria. Women undergoing long, exhausting labors with much operative manipulation are much less able to throw off a micro-organism of low virulence or to resist the inroads of one of moderate virulence. Long labor, trauma and operative shock very definitely contribute to an increased incidence of puerperal sepsis. Perhaps the two factors of trauma and prolonged labor are even more important in this connection than the actual, operative procedure itself.

SYMPTOMS

Endometritis: This is the common lesion in patients with puerperal sepsis, and there are three main types, septic, putrid and gonorrheal, each presenting a group of more or less characteristic symptoms. A septic endometritis generally appears suddenly on the second to the fourth day of the puerperium, without having given any warning of its development. As a general rule, the earlier in the puerperium the disease makes its appearance, the more virulent and dangerous is the type of infection. The patient complains of chilliness or has a well-defined chill, then develops headache and feelings of malaise. Following this the temperature begins to rise, usually, however, not reaching its peak until the second or third day of the disease. There may be some little tenderness over the uterus, which tends to be larger than anticipated. The lochial discharge, while perhaps becoming a little purulent in character, is not greatly altered. Odor is conspicuous by its absence. To the uninitiated this absence of odor may engender a false sense of security, and, therefore, it must be remembered that in the most virulent streptococcic infections the absence of odor is not a favorable indication, but rather the reverse.

The putrid endometritis may begin in precisely the same fashion, but on the fourth or even the fifth day rather than on the second or third. The initial chill is not so severe; the temperature and pulse rate elevation is not so great. The lochia becomes profuse and foul, sometimes smelling so bad as to be offensive to the attendants.

Gonorrheal endometritis, characteristically makes its appearance by fever and elevation of the pulse rate but without chill, on or about the ninth postpartum day. The time of onset is so suggestive, that it has been said, "the obstetrician may be responsible for fevers occurring during the first week, but the patient, herself, is responsible for those developing subsequently." At first, there is practically nothing but tenderness to be felt in the pelvis on moving the uterus, and even this may be variable. After several days, however, the typical symptoms of bilateral abdominal tenderness and the findings of beginning bilateral adnexitis characteristic of a gonorrheal pelvic inflammatory disease make their appearance.

Cellulitis: The initial endometritis may almost, but not quite, disappear, when about the sixth or seventh day, just as it is thought the patient is on the road to recovery, another febrile episode begins. Characteristically, the temperature does not rise so high as it did with the endometritis, but its duration is considerably longer. The patient complains of uni- or bi-lateral ab-

dominal pain just above Poupart's ligament. The uterine tenderness has largely disappeared but if a rectal examination be done at this time, tenderness and perhaps even induration will be discovered in the base of one or both broad ligaments just as they leave the cervix. It must be emphasized that simple pelvic cellulitis of the parametrial tissues of the broad ligaments is an extremely common cause of puerperal elevations of temperature. The condition is very often overlooked because the patient is not examined, or is not examined rectally. Vaginal examination, as a means of diagnosing parametritis is worthless because the involved tissues cannot be adequately reached. By rectal examination, on the other hand, the indurated broad ligaments can be readily differentiated from the surrounding structures. The overwhelming majority of patients with pelvic cellulitis recover spontaneously, and abscess or phlegmon formation occurs only in the exceptional case.

DIAGNOSIS

Puerperal endometritis of whatever form and simple parametritis are so common that they are familiar conditions and are usually readily diagnosed. From a clinical standpoint, it may be worthwhile to emphasize that any fever occurring relatively early in the puerperium should be considered to be due to an endometritis until one has definite proof that the source of the fever lies elsewhere. Many clinics routinely employ cultures taken from the cavity of the uterus for diagnosis, but in general it is felt this presents more of academic interest than it does of practical importance. Parametritis, usually following endometritis, can be readily recognized by the simple performance of rectal examination with attention directed toward the finding of indurated tissues to either side of the uterine cervix. The importance of rectal examination should be stressed. Simple pelvic cellulitis is an extremely frequent complication of the puerperium and unless rectal examination is done, these infections will frequently be overlooked. Also, the diagnosis of broad ligament abscess should offer little in the way of practical difficulties, provided one remembers that it appears during the second or third week of the puerperium. The abscess is adherent to the anterior abdominal wall and produces a tumefaction above Poupart's ligament. However, it is rare to be able to detect fluctuation in the mass, because the actual pus is surrounded by so much cellular reaction. Combined abdominal and rectal examination will usually give the clue to the condition. Phlegmon is commonly a more chronic state than most of the conditions mentioned, and when suspected, may readily be recognized by vaginal or rectal touch as a bony hard, symmetrical, hemispherical swelling usually against the lateral pelvic wall, or behind the symphysis. The most important point in the diagnosis of septicemia is the culture, both aerobically and anaerobically, of the blood. If the blood be not cultured anaerobically, many cases of septicemia will be overlooked.

TREATMENT

Prophylactic: Prophylaxis of puerperal sepsis is so vital, it hardly seems worth while to dwell upon the measures by which it may be effected. Certainly, in this

day and age we may omit a discussion of the ordinary measures of asepsis in the conduct of labor, and confine attention to a discussion of prevention of some of the less common causes of puerperal sepsis. Of these, droplet examination from carriers of streptococci is perhaps the most important. Theoretically and ideally we should take cultures from the nose and throat of all persons, both professional and lay, who are likely to come into contact with the patient at the end of pregnancy and during labor. Actually, it is possible to have cultures of doctors, nurses and attendants in the obstetric services taken at regular intervals. However, this is not enough, because it is quite possible to overlook a carrier. Therefore, it is of vital importance to insist that everyone in attendance on a parturient woman be masked adequately. To be adequate, a mask must cover both mouth and nose. To wear a mask which barely covers the upper lip is as ineffective as wearing no mask at all. Following the Sloane Hospital epidemic in 1927, it was discovered that a mask should be composed of at least four layers of gauze, be discarded when it becomes moist, and under no circumstances ever be taken off and replaced after it has been turned around. Also, it should go without saying that no physician, nurse, or attendant with coryza or active sinus infection should be allowed in a delivery room suite.

If the patient herself is suffering from upper respiratory infection, she should be cautioned against touching her genital region with the hands, and great care should be exercised to insure that her hands are thoroughly clean. Preferably, she should wear a mask also. With the recognition of the possibility of auto-infection from organisms harbored in the vagina of the patient, attempts have been made to sterilize the vagina by the application of a great variety of antiseptics. Many obstetricians believe implicitly in the efficacy of vaginal instillations, and the method is in use in certain clinics. Colebrook carried out experiments on five women, using mercurochrome and other antiseptics, checking the bacterial content of the vagina before, during and after treatment. "These five records show that the genital tract was not sterilized in any instance, following the repeated application of mercurochrome, crystal violet and brilliant green, or dettol. In two cases there were approximately as many organisms grown three hours after the first treatment as before. In all probability this failure is attributable to the multiplication of the bacteria somewhere, perhaps in the glands of the cervical canal, out of reach of the antiseptic. . . . Although the number of cases is admittedly small, this investigation suggests the tentative conclusion that it is inadvisable to attempt to improve upon nature's arrangement for keeping the genital tract free from pathogenic bacteria."

Attempts at sterilization of the vagina carry the added risk that pathogenic micro-organisms may actually be introduced with the necessary vaginal invasion by instruments. Nature has provided the woman with an adequate defense mechanism under ordinary circumstances, and to tamper with this mechanism may do harm rather than good. Although the question is still being debated, it seems to be safe to say that the majority of clinics prefer not to attempt vaginal antiseptics. This is the attitude

of the Iowa Clinic. If pathogenic organisms are present in the vaginas of certain patients, it seems that our efforts should be directed more toward conserving the resistance of the woman, thus aiding nature, than toward dubious attempts to annihilate the bacteria. These organisms grow on contused and devitalized tissue, so that avoidance of sepsis in such patients is a matter of the proper management of pregnancy and labor. Proper prenatal care will enable the physician to bring his patient to labor in the best of condition, to have formulated a prognosis as to the probable course of labor and a plan for the type of delivery. It will detect toxemias in their incipency and avoid the risk of infection which labor in a severely toxic patient entails. The proper conduct of labor, especially of operative labors and of the third stage of labor will minimize blood loss with its resulting general debility. The conservation of the patient's strength and the maintenance of her body fluids during a prolonged labor are very important. Operative procedures, when definitely indicated should be done at the optimum time, without forcing the conditions. Otherwise, operations should be reduced to a minimum. Whether or no operative interference is clearly indicated, it must be recognized that interference of any kind definitely adds to the maternal risk.

Curative—Sulphanilamide: Since the introduction of sulphanilamide, the therapy of puerperal infection has acquired renewed interest. During the ten months, May, 1937, to February, 1938, inclusive, 1,030 women were delivered at the University of Iowa. Two hundred and ninety-six of these women developed fever during the puerperium. However, the fever persisted more than 24 hours in only 117 of them. Of these 117, only 26 were considered to be sufficiently ill to warrant the employment of sulphanilamide in their treatment. The series is not large and the experience with the drug has been limited. It is further limited by the fact that after a careful review of the case histories it was apparent at the onset of the infectious process that only two of these women were desperately ill. One of these patients was delivered in May, 1937, and the other in June of the same year at the time when the use of the drug was imperfectly understood, and it so happened that the dose each of these patients received was totally inadequate. Nevertheless, each of the women recovered. Despite the inadequacy of these statistics, certain definite impressions concerning the drug were gained. In this series of relatively mild puerperal infections, most of which represented septic or putrid endometritis, it was difficult to discern any definite effects of sulphanilamide. Although the temperature rose in only three, and the pulse rate in eight of these 26 patients after exhibition of the drug, whereas in the remainder both temperature and pulse rate fell, it is entirely possible that these changes would have occurred without it. The greatest suggestion of benefit occurred when the medication was instituted as soon as there were definite indications of infection. Considering this group of patients as a whole, it seems that improvement in the patient's condition could not with certainty be ascribed to the drug. If the drug be given, it is suggested: that it be reserved for the patient who is obviously quite ill, that it be given as early in the

course of the infection as possible, and that it be given in adequate dosage.

Sulphanilamide was used in the treatment of another patient, seen in consultation, and not treated at the University of Iowa. In this patient the results seemed to be sufficiently striking to warrant reporting her case in detail.

Mrs. H., a para II, aged 30 and the wife of a physician, began to have alarming bleeding three weeks after the birth of a premature infant which succumbed a few hours after birth. Her bleeding was sufficiently frightening so that in the morning she was curetted lightly with a sharp curette and a small piece of placenta obtained. The uterus was packed and the patient returned to bed. However, she bled through the pack, and late the same afternoon, when her red blood count was 1,950,000 and her hemoglobin estimation was 46 per cent, she was again taken to the operating room, the pack removed and another substituted for it. In addition, the vagina was packed. The following morning, 24 hours after the interference, the patient had a chill and both packs were removed. She did not bleed, and in fact during the course of her subsequent illness, did not again bleed from the uterus. Following the chill her temperature began to rise by remitting steps interspersed with chills. The pulse rate rose with the fever. Forty-eight hours after the curettage her temperature was hovering around 103° F. and her pulse rate around 130, while her white count was 7,700. By this time she had received two blood transfusions and prontosil administration was begun. Examination revealed no evidence whatsoever of pelvic disease. The uterus was well involuted, freely movable without pain, and the parametria were clear. There was neither abdominal tenderness nor rigidity. The following day, 72 hours after operation, her temperature and pulse reached a maximum of 105° F. and 160 per minute, respectively. Both prontosil and prontosil were given in large doses so that during a period of three days she received a total of 210 grains of prontosil and 225 cubic centimeters of prontosil. Also, she received a total of 1,400 cubic centimeters of blood in five transfusions. By the sixth day her temperature and pulse rate had subsided as dramatically as they rose, and she has continued to be fever free. As the fever began to subside, the white blood count rose to 14,000. Final examination again showed a perfectly normal pelvis. The blood was cultured during the height of the illness, but as it was not cultured anaerobically, no growth was reported. In summary, this patient presented an overwhelming infection, originating in the uterus, but spreading with such lightning rapidity to the general system that it not only swept through the uterus without leaving demonstrable traces, but also hardly allowed the body sufficient time to develop a leucocytic response. It is impossible to say why this patient recovered, or why she recovered with such dramatic rapidity. She received two recognized therapeutic agents, blood transfusions and sulphanilamide. However, it is the opinion of the consultants who saw this patient that she would not have recovered without one or both of these agents.

Certainly, by the exhibition of sulphanilamide in a patient as ill as the one reported, there is nothing to lose, and everything to gain. Cecil Jones has given a very excellent resume of sulphanilamide in the *Journal of the Iowa State Medical Society*. He states that a blood concentration of six milligrams per 100 cubic centimeters is adequate for mild infections, and 10 to 15 milligrams per 100 cubic centimeters in severe infections, and that in order to achieve this concentration it is necessary to administer 60 to 80 grains every 24 hours in the mild and 120 to 160 grains in the severe infections. He recommends that the total 24-hour dose be given as the first dose, to be followed at four hourly intervals with the fractional 24-hour dose. It is well recognized that prontosil by injection is not as effective as prontosil by mouth in achieving the required blood concentration. Prontosil is given by mouth in tablet

form because it is not readily soluble. Occasionally, however, patients do not tolerate the drug well by oral administration, and it becomes necessary to resort to injection. In order to administer the more desirable prontosil in such cases, the Department of Urology at Iowa has been dissolving 0.8 gram of prontosil in 100 cubic centimeters of boiling normal saline or of distilled water. When cooled the solution is ready for use, but should be made fresh each time its use is contemplated.

Other Measures: Sulphanilamide, while it represents a distinct aid to the therapeutics of puerperal infection, cannot, in the light of present knowledge, supplant all of the measures which have hitherto been employed. Of these, blood transfusion is the most important, and probably is the most valuable single therapeutic agent or method available. Its action is imperfectly understood, but clinicians generally, are in complete agreement with regard to its value. Aside from its other actions, it supplies red and white cells and hemoglobin, urgently needed by a patient seriously ill with infection. Like sulphanilamide, blood should be given at the onset of an infection. It is generally possible to prognosticate the intensity of an endometritis in its initial stages by the time of onset and the rapidity with which the pulse rate and temperature rise. Elevation of temperature, unaccompanied by a commensurate rise in pulse rate, generally bespeaks for a mild, infectious process, while parallel, rapid rise of both temperature and pulse rate in the first days of the puerperium signifies a severe one. Usually, small, repeated transfusions of 250 to 300 cubic centimeters each are administered at one to two day intervals.

With a mild septic, or putrid, endometritis, the usual supportive measures consisting of fluids, ice bags locally, sedatives, light diet, et cetera, in addition to the use of an ergot preparation will often control the process. Ergot, usually ergotrate, is used in courses of six, four hourly doses. Because of the increased danger of ergot poisoning in the presence of sepsis, it is generally wise to use not more than two courses with at least one day's interval free from medication. Gonorrheal endometritis, spreading to involve the tubes and ovaries, requires supportive and symptomatic therapy. Its treatment in no wise differs from the conservative therapy usually employed when these infections occur in the non-puerperal woman. It is hardly necessary to say that surgical attack is contraindicated during the acute stage unless it be employed for the pelvic drainage of pus accumulations. When an acute endometritis has subsided only to be followed by the development of a cellulitis, supportive therapy should be employed until the fever begins to abate. Pelvic heat, administered by the Elliott machine, short wave, or by the long, hot, low-pressure douche, then becomes an invaluable therapeutic agent, materially shortening the course of the resolution. If the cellulitic infection localizes into an abscess, the only rational therapeutic procedure is surgical drainage, generally performed through an abdominal wall, muscle-splitting incision. The optimum time to drain requires a nicety of surgical judgment. In general it may be said that more sins are committed by premature, rather than by delayed drainage. One frequently opens into a suspected abscess,

only to find not pus, but necrotic cellular debris. A safe rule is to wait several days to a week after one feels that the abscess is ripe for drainage. Phlegmon, like simple cellulitis, responds to the local application of heat, but much more slowly. As this complication persists sometimes for months after the fever has subsided, it is often impossible to convince the patient that continued treatment is valuable.

Enough has been said already about the medical treatment of the more serious complications, septicemia, pyemia and peritonitis. Some men advocate surgical drainage of the abdominal cavity for peritonitis, either by a low abdominal incision, by vaginal opening of the culdesac, or by the performance of hysterectomy leaving the vaginal apex widely open. Such radical measures are to be condemned. Performed too soon, they result at least in the unnecessary mutilation of many women and may cause extension of the process, while if they are performed late they are usually of no avail. It may be worth while, during a discussion of operative procedures, to mention curettage. If the infection has spread beyond the uterus, curettage cannot possibly benefit the patient. If the infection remains within the uterine cavity, it may be so mild that the patient will get well without it. In any event, curettage may break down the leucocytic barrier, thus destroying the primary line of defense and even remove the few chances for recovery which remain

to the patient. It is recognized that the urge on the part of the obstetrician to "do something" when a serious infection arises amounts almost to a compulsion, but the thought of the Hippocratic doctrine of abstinence from "whatever is deleterious and mischievous" should stay his hand.

Phlebitis requires the usual treatment of ice and elevation of the part, sedatives and bed rest until the temperature has remained normal for at least a week in order to prevent the loosening of an embolus. Ligation of the pelvic veins has been advocated as a life-saving measure in certain cases of endopelvic thrombophlebitis. However, the ability to determine when operation is indicated is possessed by very few men in the world, and the procedure is certainly not adapted to general practice. Often the venous stasis resulting from prolonged bed rest during the puerperium, especially in the presence of a symptomless, low-grade fever, favors the development of thrombophlebitis. It is our practice to allow women to get out of bed on the seventh postpartum day, and since the adoption of this custom, the incidence of thrombophlebitis has markedly decreased.

Nothing has been said concerning vaccines and immune sera. In general, their efficacy has never been proved and their use is not recommended.

Let me conclude with the old aphorism, "Prevention is better than cure."

Presidential Address*

E. A. Pittenger, M.D., F.A.C.S.

Aberdeen, South Dakota

The medical profession in South Dakota has several very important decisions to make in the next few months. We are electing a new legislature from which we are asking several very important laws vitally concerning the profession. Our contract with the Farm Security Administration for relief expires July 1st, and we must decide if we wish to continue our present form of emergency medical care for relief clients. We should start to formulate some plan of postgraduate medical education for the profession of the state, and make more use of our speaker's bureau. Much work must also be done in the next few months with the Allied Council, and the doctors of South Dakota have a responsibility in our state medical school which must be assumed by the profession.

Realizing these many responsibilities, your officers in the last month have covered the entire state and explained these matters to the profession. The Allied Council has sent out a letter to all its members giving a record of the vote of the members of the last legislature on several bills in which the professions were interested. We have asked the individual doctors to be-

come active in their respective party organizations, so that the profession can be given proper consideration irrespective of the party in power. All this has been done, before the primary election so as to make the successful candidate conscious of the fact that the professions are going to take an active part in the coming campaign. This work must be continued right up to election day. We must contact all the candidates for the House and the Senate and explain the bills which we expect them to consider.

The cults have been sending letters to the members of the last legislature, for months, in which all forms of attacks are made on the medical profession, and we are put in the worst possible position to these former members of the legislature. This form of attack on the profession accounts for a great deal of the opposition which we encountered during the last session of the legislature. The cults had started early in the campaign, and not only had several of their friends in the legislature, but had continued their adverse propaganda on the medical profession until it was impossible to get any form of medical legislation considered, and the osteopaths were

* Read before the South Dakota State Medical Association annual meeting, May 9, 10, 11, Huron.

able to put one of their members on the State Board of Health.

Now, unless the individual doctor is willing to contribute of his time and money and become immediately active in this fight against the cults, we might just as well forget any legislative program for next year. If the 450 doctors in South Dakota could realize what is being put over on them by about 75 osteopaths in the state, who are united and willing to contribute their time and money, we would have no trouble in passing any form of legislative program we might care to consider.

This year our legislative program consists of three bills: First, a basic science law to protect us from the influx of irregular practitioners who are being forced out of the surrounding states by their basic science laws. Secondly, we are asking for a new annual registration of physicians which would make all doctors members of the state association such as the pharmaceutical and legal professions have at the present time. Our third bill would require anyone using the term "doctor" in any form of advertising to specify on what authority they are using the title. In many of our smaller communities, we have osteopaths practicing medicine and the general public think they are regular qualified M.D.'s.

Our contract with the Farm Security Administration expires in July of this year. First, let us consider the history of this relief measure. One of our doctors in the country west of the river wrote Governor Berry and stated that there were people in his territory in need of medical care and supplies, and for financial reasons were unable to secure adequate medical services. This letter was transmitted to the Council of the state medical society and a committee was appointed to contact the farm relief agencies and see what could be done. Finally, Dr. Williams, from the relief set-up in Washington, came out and made a personal survey and found that help was needed. To give these people the necessary care and still secure adequate funds from the Federal Government, as the state had no money to put into the project, the Farmer's Aid Corporation was formed and they, in turn, made contracts with the different professions through the Allied Council. The members of the Allied Council reported to their respective associations and fee schedules were agreed upon with the Farm Security Administration to care for the emergency relief work. The funds were sufficient to pay the bills for January and February in full but we are going to have to take a pro-rata reduction in our bills for March and April. This is due to several factors. Some of the doctors have been sending in bills for work that was not emergency work. The worst feature we have had to contend with has been the attitude of some of the county commissioners. They have tried to load part of the indigent poor load upon us when it should be paid by the county, and is not part of the work we contracted to do. If we could hold this work to only emergency cases of the farm relief clients and not make it include a lot of the indigent poor, I feel that sufficient funds could still be secured to pay our bills in full and still give adequate medical care to the farm clients as we contracted to do. This relief is not so important in several parts of the state, especially east of the river, but there are regions in the state where

this is about the only income that the doctors are getting; if this is not continued, it will be necessary for the doctors to close their offices and move to a more remunerative territory. For this reason, I feel that we should not take a selfish attitude, but should take these doctors into consideration when any decision is made. It seems to me that the same situation exists as at the forming of this program, and by the present outlook for the year, will continue so for at least another 12 months.

In many of the adjoining states, a very satisfactory plan of postgraduate education for the profession has been worked out. We have made several rather feeble attempts at this in South Dakota, but as it is a means of improving the service rendered to the general public by our profession, I feel that we should take some action at this session to get this important work started. Also we should make more use of our speaker's bureau in the state and district medical societies as suggested by our economics committee two years ago. Each district society should canvass their membership and find what subjects the doctors are willing to discuss before lay audiences. Then a list should be made and given to the clubs and social groups in the communities so that they can secure these speakers through the officers of the district medical society, and in that way keep the speaker's bureau under the control of the society. This is of vast importance to the profession in educating the public along medical lines and will do much to help overcome the adverse propaganda being spread by the cults. In some states the district societies are coöperating with the newspapers in their communities to publish facts regarding hospital facilities and new features in the practice of medicine in order to improve this relation between the general public and the profession. We all realize that this relationship must be improved in every manner possible if we are to get our just consideration from the professional politicians in our legal program.

The Allied Council have a well planned and extensive program for the summer. I am asking the medical profession to assist them in every way, as they have agreed to support our entire legislative program. Meetings will be held in all of the trade centers of the state and officers will be elected in these local units to contact the legislative candidates and explain our program before election. Several of these district meetings have already been held and by the first of July, they expect to have the entire state organized so that constructive work can be done early in the campaign. In this, the medical profession has fallen down in previous years. They did not become interested in the candidates until they were in Pierre and the legislature was in session; by that time, many of them had been committed to support the cults. By starting early and taking an active part in the campaign, we can avoid such a condition at this session.

The medical school of the University of South Dakota must have the support of the medical profession in the state. We did not assume this responsibility as we should, and the result was that the politicians continued to reduce the budget of the school until it was an absolute impossibility to operate an accredited medical school on the money allowed. The result was that in 1937 the Board of Regents were informed by the Committee

on Medical Education of the American Medical Association that they could not enroll a new class in freshmen medicine in September 1937. Through the action of the alumni and the coöperation of the state medical society, the budget was raised to the amount requested by the American Medical Association and the school was allowed to enroll a provisional class in the fall of 1937 which would be protected when they transferred to a four year school. In February 1938, this same plan was extended for another year to give the school authorities more time to continue their reorganization. Within the last month, the school was inspected by the Association of American Medical Colleges, and I understand made

a creditable showing. But the medical profession of the state must assist the Board of Regents in seeing that the budget of the medical school is not reduced during this session of the legislature. Also we must be ready to lend whatever assistance is necessary when the final consideration of the rating of the school is made in June 1939 when the Committee meets at the annual convention of the American Medical Association.

I wish to take this opportunity to thank the many doctors who have so materially assisted me during the past year, and I want to assure you that I sincerely appreciate their help.

Report of the Eye Health Committee of the American Student Health Association

A STATEMENT OF THE PROBLEM

THERE are 1,250,000 students in the colleges and universities of the country. Reports from medical directors of college student health services estimate that 15 to 25 per cent of these students enter college with serious visual defects. Presumably, at college entrance, the students planned to follow a four-year course of study in which achievement may be conditioned more or less by ability to receive mental stimulation from the printed page.

The concern of college administrators and faculties with the eye health problems revealed by the medical service, has been based to date on the fear that eye efficiency is a factor in the student's college success. Recent reports on the vision of school children, in the presentation of facts and arguments, tend to show that a high percentage of honor students are myopic, and that myopia (popularly considered as weak eyes) far from interfering with the intellectual progress of the student, rather favors attention to study.

These reports, by failing to deal with the visual defects that might interfere with a student's application to close work, tend to allay the fears of educators that the student's vision is of vital concern to the college faculty. It appears, however, that instead of becoming complacent over such findings, college faculties should begin to take cognizance of what is happening to the eye health of the student during the four years of his college career.

The assembling of evidence to aid in the study of this problem is not a simple task. Most colleges provide only a routine Snellen test of vision for their students at entrance, and the present practices in vision appraisal show wide variations as to test objects in use; conditions

under which the test is given; actual testing procedures; method of recording results; and interpretation of findings.

To date, one published study, dealing specifically with the college problem, is by Boynton¹ of the University of Minnesota, who investigated the eye records of 1,000 students given a Snellen test at college entrance and again at graduation.

From this study, it appears that to begin with, college students at entrance have twice as high an incidence of visual defects as that found by Collins and Britten² among industrial workers of the same age group. This conclusion is further supported by the findings of Sydenstricker and Britten³ that the highest incidence of visual defects is to be found in the professions, with the skilled industrial worker ranking third.

From Boynton's study, it would appear that not only do students enter college with a higher incidence of visual defects than their contemporaries in age who go into the industries, but that during the college career, about one in six of those entering with presumably good vision will need glasses before graduation, and during the college career one in eleven of the same group will suffer a serious loss of visual acuity.

Unpublished estimates and reports of medical directors in other colleges tell a similar story. Smiley⁴ of Cornell University reports that 50 per cent of entering freshmen wear glasses or should do so, and that by the senior year the need of glasses has increased to 75 per cent of the student group.

Ferguson⁵ of Western Reserve University (where an annual routine vision test is required), reports persistent

and repeated complaints of headache and blurs among freshmen and sophomore students rating 6/6 on the Snellen test, and a cessation of the complaints following an ophthalmic examination and correction.

Stookey⁶ (ophthalmologist), of the University of Utah, reports that among the backward or failing students the incidence of heterophoria is sufficiently high to merit attention and requests that a study be made of the problem. His observation of the possible relationship between heterophoria and reduced visual efficiency may find support in Robertson's⁷ report on the incidence of hyperphoria and exophoria among aviators (of the college-age group) showing delayed adjustment of vision.

Schonwald,⁸ Miami University, reporting on 187 consecutive refraction records (with mydiatries) of college students states that of the 94 hyperopic cases (all complaining headaches), only 27 had been detected by the Snellen test. These had a substantial astigmatic error.

A report from the United States Naval Academy at Annapolis⁹ indicates that the incidence of disqualification of senior cadets because of visual impairment became so troublesome that it was thought necessary to require each cadet on entrance to pass a strict ophthalmic examination including refraction. During the period 1927-37, when the Snellen test alone was used to find defective vision, the percentage of students disqualified at entrance and in each successive year of the course, because of defective vision, was, respectively, 4.61; 0.9; 1.1; and 4.7; a total disqualification of about 11 per cent. In 1937, all candidates were given in addition to the Snellen test, a full ophthalmic examination with refraction. Thirteen per cent of 703 applicants were disqualified because of defective vision. Time will tell whether additional disqualification on account of defective vision will be necessary before graduation.

The need for an ophthalmic examination at college entrance is no doubt as urgent elsewhere as at Annapolis. In the colleges, however, the purpose would be to find early the student needing ophthalmic supervision. Yet, with the possible exception of one college, the current practice in appraisal of student vision at college entrance includes only a routine vision test with a Snellen chart. When one considers the demands made on the student's eyes during the four years in college, steps toward maintenance of good visual acuity appear desirable and an ophthalmic examination seems to be a reasonable prerequisite for college entrance.

What is the next step? Should colleges carry on a continuous educational program with parents and high school faculty and students to secure an ophthalmic examination and follow-up as a routine preparation for college life? Is there something that the college might do in addition to the Snellen test to be sure that the student needing ophthalmic care is directed to it early in his college career? Should the college provide an ophthalmic examination to all students at entrance? How shall the cost of correction and re-examination be met? What adjustment of the student eye load shall be made to meet a given eye condition?

The Eye Health Committee believes that a full ophthalmic examination for college students is a desirable goal which the American Student Health Association might well keep in view. That some time may elapse before such service is available to many groups of students is probable. In addition to departmental budgets, the following questions are important: (1) Is an ophthalmic examination a fundamental prerequisite to a college career? (2) Is the policy of providing ophthalmic service to college students socially sound? These questions must be understood and answered.

The executive council of the American Academy of Ophthalmology and Otolaryngology, recognizing the seriousness of the problem, has appointed a committee of ophthalmologists to work with the Eye Health Committee on a study of the problem of vision appraisal and supervision of college students.

The Eye Health Committee believes that the final solution of the problem must wait on research and will be reached only through active coöperation with ophthalmologists; hence, at this time it offers suggestions of means (other than the Snellen chart) of detecting students needing ophthalmic care only on the recommendation of the Advisory Committee.

It is the hope of the Eye Health Committee that medical directors of the student health services in the colleges in the country will actively interest themselves in the eye health problems of college students, and lend their assistance to the committee's efforts to find a solution.

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MINNEAPOLIS, MINN., DECEMBER, 1938

AMERICAN STUDENT HEALTH ASSOCIATION

The American Student Health Association will hold its nineteenth annual meeting in New York on December 29th and 30th with headquarters at the Hotel New Yorker. This Association, composed of 164 colleges and universities, has wisely guided the development of health programs in colleges throughout the country.

Resolutions passed by the American Student Health Association in 1930 briefly state the philosophy underlying student health work.

1. It is generally believed that a fundamental objective of higher education is to develop the ability of the individual to live a more useful, effective, and happy life.

2. Health (emotional and physical) is recognized as one of the greatest factors in the realization of this objective.

3. It is a major responsibility of every college and university to develop and protect the health of the student and to educate him in scientific health conservation.

The growth of the American Student Health Association and its local sections is evidence of the increasing interest in health education in our institutions of higher learning. The coming meeting of the Association offers an opportunity for all engaged in college health work to meet together and discuss their common problems.

R. E. B.

THE CHRISTMAS SEAL

When the National Tuberculosis Association was organized in 1904, its goal was clearly defined and the method outlined, but funds were woefully lacking. In fact, the total receipts reported in the Transactions of the first meeting consisted of \$10,367.15. After the expenses were deducted, only \$7,002.19 remained. When, in 1907, Miss Emily Bissell of Wilmington, Delaware, obtained a revenue of \$3,000 for local use from the first sale of tuberculosis Christmas seals in this country, its present importance could not have been anticipated. Even after Miss Bissell persuaded the American Red Cross to place the seal sale on a nation-wide basis in 1908 and a revenue of \$135,000 resulted, it was still thought to be only a passing fad. In 1910 the American Red Cross made an arrangement with the National Tuberculosis Association whereby the latter organization was to have the Christmas seal as its source of revenue. Other health and philanthropic organizations have, to a large extent, refrained from promoting their work through similar money-raising schemes, leaving the Christmas seal closely identified with tuberculosis in the mind of the general public. The revenue from the seal increased, reaching its peak in 1929, when it amounted to \$5,546,146.91. In the earlier years of the depression there was considerable decrease, but in 1937 the total amount was \$4,986,311.65, 95 per cent of which remained in the state that raised the money.

During the Christmas seal sale, it is heartening to view in cities and hamlets, displays, such as the large electric-

lighted double-barred cross, so located that all may see; the posters in the windows of nearly all business establishments and even in many rural homes. It is a delight to see both children and adults buying Christmas seals and to read essays on tuberculosis prepared by girls and boys from schools all over the nation, for in so doing they are learning about tuberculosis themselves. These citizens of tomorrow are trained in the fundamentals of tuberculosis control and will be in a better position than any previous generation to stamp out tuberculosis.

With the increase in revenue, more state and local tuberculosis societies were organized until today there are 1528 affiliated associations and societies in the United States. In addition, there are 1181 tuberculosis committees making a grand total of 2709 special tuberculosis organizations.

As funds became available the educational work was intensified. The secretaries of tuberculosis associations, both state and local, expanded their facilities for information of the public concerning tuberculosis. In almost every community persons of every class volunteered their services, to aid in controlling this great scourge of mankind. The educational work was effective for we can now say that there is no disease concerning which the citizens of this nation are as well informed as tuberculosis. The results of the educational campaign made possible through the Christmas seal have been amazing. When this method of fund-raising began, approximately 200 persons lost their lives each year for every 100,000 of the population; now only approximately 55 persons per 100,000 of the population die each year and in some states less than 30. Along with the decrease in mortality has come a parallel decrease in morbidity and along with this, a decrease in the infection attack rate. Even among high school children in some parts of the country not more than 5 to 10 per cent have been infected. Since we know that it is only the infected who are potential cases of clinical tuberculosis, the importance of this low incidence of infection becomes apparent.

Education through the National Tuberculosis Association and its component organizations has greatly aided those responsible for controlling tuberculosis in the animal herds. Here the veterinarians and closely allied groups are about to complete the greatest demonstration of tuberculosis control known to man. In fact, of the 3134 counties in the United States all but 14 had been accredited on October 1, 1938.

Much work remains to be done before tuberculosis is controlled to the same extent as diphtheria and typhoid

fever. Nevertheless, this accomplishment is possible and liberal buying of tuberculosis Christmas seals by the citizens of the United States will do much to hasten this accomplishment.

J. A. M.

SYMPTOMLESS CORONARY PATHOLOGY

Inability to diagnose coronary disease in time to give at least a friendly warning has been a great disappointment to the medical profession of all times. Without the presence of arrhythmia, hypertrophy, or discernable murmurs, we have been accustomed to consider that we were dealing with a normal heart. Whether because of an increase in the prevalence of the disease itself or a more careful post mortem scrutiny, certain it is that our diagnostic ability to predict its presence is not keeping up with the appalling frequency of reported findings.

The advent of the electrocardiograph was hailed as a solution for our perplexities, but inasmuch as many individuals succumb in the first attack with little or no premonition of impending danger, they gained nothing by the existence of this invention. Others, it is sad to say, have gone home after an electrocardiographic examination with assurances that their hearts were perfectly normal only to die in a few hours.

We have it on the authority of Dr. D. E. W. Wenstrand, Medical Director of the Northwestern Mutual Life Insurance Company of Milwaukee, that recent statistics show exactly one-sixth of all first-year deaths to be due to coronary occlusion of one kind or another.

There have been national organizations created for the special task of fighting tuberculosis, cancer, and heart disease; and headway has been made in the order in which they were launched. The important preachment in each has been that of early diagnosis; and progress in treatment and cure has been made accordingly. In tuberculosis, we have the Mantoux test and X-rays; in suspected cancer, X-rays and biopsy; but in heart conditions without subjective symptoms, we are still at a loss to determine whether or not pathology exists after resorting to the time-honored methods of palpation, percussion, and auscultation.

The electrocardiograph is valuable, of course—it helps to clear up many perplexing conditions and confirm suspected cases, but it is humiliating indeed to have three patients in the course of a few months die suddenly of coronary disease within twenty-four hours after negative findings by competent electrocardiologists.

A. E. H.

Book Reviews

A Textbook of Medical Bacteriology, by DAVID L. BELDING, M.D., and ALICE T. MARSTON, Ph.D.; cloth, 592 pages, illustrated; New York: D. Appleton-Century Co., Inc.: 1938. Price \$5.00.

This comprehensive volume on bacteriology is intermediate between the reference books and the elementary texts. It pre-

sents the basic principles of bacteriology particularly adapted to medical students and general practitioners. The scope and history of bacteriology, the classification of bacteria, the morphology of bacteria, the chemical composition, cultivation, the growth of bacteria, and variability of bacteria are presented in great detail. Section II is devoted to medical bacteriology; Section III to pathogenic enbacterales; Section IV to pathogenic actinomycetales (higher bacteria); Section V to pathogenic fungi; Section VI to the spirochaetes; Section VII to the viruses; Section VIII to immunity; Section IX to sanitary and economic bacteriology. The text is clearly presented and illustrated and is a valuable modern bacteriological handbook.

Future Meetings

**American Student Health Association
Preliminary Program
Hotel New Yorker — New York City
December 29-30, 1938**

Session I:

THURSDAY, DECEMBER 29

9:00 to 10:30

9:00 Registration.

9:30 Call to Order.

Secretary's Report—Dr. Boynton.

Report of Sectional Chairman—Dr. Smiley.

Report of Tuberculosis Committee—Dr. Lyght.

Appointment of Nominating Committee.

Session II:

10:30 to 12:00—General Session

- A. *Committee on Health Service*, Dr. Canuteson, chairman. Subject and speaker to be announced.
- B. *Committee on Informational Hygiene*, Dr. Kirkpatrick, chairman. Tentative Reports and Recommendations of the Committee. Dr. T. B. Kirkpatrick.
- C. *Committee on Organization and Administration*, Dr. Pryor, chairman. An Evaluation of Health Service Procedures. Dr. W. E. Forsythe.

Association Luncheon—12:15

President's Address—Dr. Charles E. Shepard.

For purposes of round table discussions in Session III, the representatives will gather into six general groups, according to the type of institution they represent.

Session III:

2:00 to 3:30—Round Tables

Committee on Health Service

Dr. Canuteson, chairman

Round Table No. I. Representatives from all state-supported and large endowed co-educational colleges and universities. Doctor Lees, sub-chairman.

Round Table No. II. Representatives from all small endowed co-educational colleges and universities. Dr. Armstrong, sub-chairman.

Round Table No. III. Representatives from Women's Colleges. Dr. Collings, sub-chairman.

Round Table No. IV. Representatives from Men's Colleges. Dr. Bock, sub-chairman.

Round Table No. V. Representatives from municipal colleges and universities having almost exclusive day school enrollments. Dr. Sander, sub-chairman.

Round Table No. VI. Representatives of Teachers Colleges. Dr. DeWeese, sub-chairman.

3:30 to 5:00—Round Tables

Committee on Organization and Administration

Dr. Pryor, chairman

Round Table No. I. Representatives from all state-sup-

ported and large endowed co-educational colleges and universities. Dr. Donald, sub-chairman.

Round Table No. II. Representatives from all small endowed co-educational colleges and universities. Dr. Blydenburgh, sub-chairman.

Round Table No. III. Representatives from Women's Colleges. Dr. Hiller, sub-chairman.

Round Table No. IV. Representatives from Men's Colleges. Dr. Ritenour, sub-chairman.

Round Table No. V. Representatives from municipal colleges and universities having almost exclusive day school enrollments. Dr. Woll, sub-chairman.

Round Table No. VI. Representatives of Teachers Colleges. Dr. Glenadine Snow, sub-chairman.

Council Dinner—6:30 P. M.

FRIDAY, DECEMBER 30

Session IV:

9:00 to 10:30—Round Tables

(A and B to run concurrently)

- A. *Committee on Health Service*, Dr. Canuteson, chairman. Discussion leaders: Drs. Lees, Armstrong, Collings, Bock, Sander, Herrick.
- B. *Committee on Informational Hygiene*, Dr. Kirkpatrick, chairman. Discussion leaders: Drs. Forsythe, deKruif, Gould, Scott, Turner, Wood.

Session V:

10:30 to 12:00—Round Tables

(C and D to run concurrently)

- C. *Committee on Organization and Administration*, Dr. Pryor, chairman. Discussion leaders: Drs. Donald, Blydenburgh, Hiller, Ritenour, Woll, Snow.
- D. *Committee on Hygiene of Physical Education Activities*, Dr. Storey, chairman. Discussion leaders: Drs. Chenoweth, Howe, Kler, York.

Business Meeting—12:00 to 12:30

Report of Council Meetings.

Report of Nominating Committee.

Report of Eye Health Committee, Dr. Bradshaw.

Council Luncheon—12:30**Session VI:**

2:00 to 4:00—General Session

- A. *Hygiene of Physical Activities*, Dr. T. A. Storey. Discussion opened by Dr. York, Dr. Chenoweth, Dr. Howe, Dr. Kler.
- B. *Mental Hygiene*. Dr. Raphael, chairman. Subject and speaker to be announced.
- C. *Eye Health*. Dr. Bradshaw, chairman. Eye Health of College Students, Dr. Annette Phelan. Discussion opened by Dr. LeGrand Hardy.
- D. *Health Service*. Dr. Canuteson, chairman. Incidence of Syphilis, Dr. R. A. Vonderlehr.

Reports of Chairmen of Round Tables

(10 minutes)

1. Health Service, Dr. Canuteson.
2. Informational Hygiene, Dr. Kirkpatrick.
3. Organization and Administration, Dr. Pryor.

News Items

Emergency medical care for eligible low-income farm families in North Dakota has been arranged by the Farm Security Administration with the coöperation of the state medical association and professional groups. Under this plan, which also applies in South Dakota, medical care will be given at a cost of \$2 per month per family. According to Dr. W. W. Alexander, FSA administrator, about 37,000 families in the state will be eligible to participate.

Dr. J. R. Westaby of Madison, South Dakota, state delegate to the American Medical Association meeting, addressed the Seventh District Medical Auxiliary last month on the subject of socialized medicine. At a previous meeting, the Auxiliary heard Dr. L. J. Pankow of Sioux Falls explain the new Basic Science law which will be voted on at the coming session of the state legislature. The Medical Auxiliary was instrumental in having Dr. Pankow explain the same law to the City Federation of Women's Clubs.

Dr. J. H. P. Gauss of Indianapolis was elected president of the alumni association of the Mayo Foundation at the twentieth annual meeting held in Rochester, Minnesota. He succeeds Dr. James M. Hayes of Minneapolis. Other officers are Dr. Lester Powell of Des Moines, first vice-president; Dr. George Constans of Bismarck, North Dakota, second vice-president; Dr. J. Richard Aurelius of St. Paul, re-elected secretary; Dr. D. M. Masson, Rochester, associate secretary and treasurer. Dr. William J. Mayo and Dr. Charles H. Mayo are honorary presidents of the association.

Dr. A. H. Reiswig was named president of the Richland County, North Dakota, Medical association at the annual business meeting held last month. Other officers are Dr. Louis O'Brien, vice-president, and Dr. C. V. Bateman, secretary-treasurer.

Dr. E. G. Sasse, Lidgerwood, North Dakota, was titled "Lidgerwood's Number 1 Citizen" by Mayor C. A. Bonzer recently. The occasion was a surprise birthday reception at which time fellow citizens honored Dr. Sasse, expressing their appreciation of his 40 years of service to the community.

Five Minneapolis doctors last month were notified they had passed examinations for certificates from the American Board of Surgery. They are Drs. Ernest R. Anderson, U. Schuyler Anderson, Kenneth Fritzell, George Eitel and Wallace Nelson.

A \$15,000 gift to the National Anti-Syphilis Committee of the American Social Hygiene Association raises the total in its \$500,000 appeal to \$187,065 and will aid in promoting National Social Hygiene Day, February 1. The announcement was made by Dr. Ray Luman Wilbur, president, following action of the administrative committee in naming the date for the annual nationwide observance. The donor requested that the gift be anonymous.

Dr. J. W. Brackett, Belle Fourche, South Dakota, has gone to Long Beach, California, where he expects to remain for the next six months.

Graduate Fellowships in Anesthesiology have been established by the Medical School and Graduate School of the University of Minnesota for physicians who desire to prepare themselves for the practice of this specialty. The fellowships offer an abundance of clinical training in all types of local, regional and general anesthesia and gas therapy, and also adequate related graduate work in chemistry, anatomy, physiology, pharmacology. Applicants must have served at least one year in a rotating internship.

Presidential approval for the construction of a hospital at Wall, South Dakota, and a community hut at Quinn have been received at the district W.P.A. offices in Rapid City, it was announced recently. The Wall hospital appropriation is for \$10,840 of which \$4,560 is furnished locally. The Quinn community hut will cost \$3,090. Of this amount, \$840 is supplied from local funds.

Dr. Dallas B. Phemister of Chicago, Illinois, professor and chairman of the Department of Surgery at the University of Chicago, will give the sixth E. Starr Judd Lecture at the University of Minnesota at the Medical Science Amphitheater on Wednesday, February 1, at 8:15 P. M. The subject of Dr. Phemister's lecture is "Pathogenesis of Gallstones." The late E. Starr Judd, an alumnus of the Medical School of the University of Minnesota, established this annual lectureship in surgery a few years before his death.

Dr. Gundar Christianson has moved from Bismarck to Sharon, North Dakota.

Necrology

Dr. Frederick V. Lyman, 59, of Velva, North Dakota, died October 29, 1938, in a hospital in Minot after an illness of four hours. A native of Elkader, Iowa, Dr. Lyman spent his boyhood in Caledonia, Minnesota. He was graduated from the University of Minnesota medical school in 1903, and practiced in both Minnesota and North Dakota. He was city health officer of Velva.

Dr. Matrin J. Fardy, 45, of Minot, North Dakota, died in Los Angeles, California, October 27, 1938. He had been spending the past six months in California for his health. Dr. Fardy was chief of staff at St. Mary's hospital, Minot, and president of the Northwest District Medical society.

Dr. Robert Hill, 73, Ipswich, South Dakota, died October 23, 1938. He had practiced in Ipswich for 42 years.

Dr. G. A. Christensen, 74, Cass Lake, Minnesota, passed away October 9, 1938.

Dr. Jerome F. Smersh, 45, Owatonna, Minnesota, died recently. He was president of the Owatonna board of health and had practiced there since 1919.

